

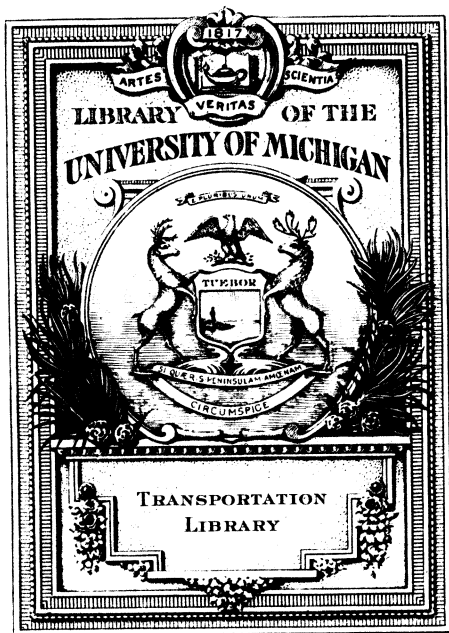
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Chas. J. Perry

Feb. 1902



1st. Brit. Patent Office

PATENTS FOR INVENTIONS.

# ABRIDGMENTS

OF

## Specifications

RELATING TO

CARRIAGES AND OTHER VEHICLES  
FOR COMMON ROADS.

A.D. 1625-1866.

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1880.



## PREFACE.

This volume is the first part of the series of abridgments entitled "Carriages and other Vehicles for Common Roads," and it deals with the specifications from the earliest date to the end of the year 1866. In the next part this series will be carried on to the end of the year 1876. Until that is published, the inventor can continue his search by the aid of the subject-matter indexes and the specifications.

It should be borne in mind that the abridgments are merely intended to serve as guides to the specifications, which must themselves be consulted for minute details of any particular inventions. At the foot of each abridgment is stated the price at which a printed copy of the specification may be purchased at the Commissioners of Patents' Sale Department (38, Cursitor Street, Chancery Lane, E.C.). The volume is furnished with a copious index of subjects, and an index to the names of patentees and inventors.

This series, as its name imports, comprises inventions relating to the general construction and arrangement of carriages for common roads, whether such carriages be drawn or propelled by animal, steam, or other power. It also embraces inventions in near relation to wheeled carriages for common roads, as, for example, hand barrows, sack trucks, and some machines used for agricultural purposes. Carriages for tram-roads are included, though much relating to this head of the subject will be found in the series relating to "Carriages and other Vehicles for Railways."

A large number of the specifications relating to wheels, tires, axles, axle-boxes, springs, and brake and skidding apparatus, do not specially claim any application to either common road or railway purposes. Such inventions will be found in-

cluded in the series of "Carriages and other Vehicles for "Railways." Where, however, special mention is made of a common road use, the abridgment has been repeated in this series.

Inventions relating to traction engines also form part of this work, but prominence is given to the running gear and special features fitting the engine for running on roads, rather than to the construction of the boiler and propelling engine itself. For these subjects the series entitled the "Preparation and Combustion of Fuel" and the "Steam "Engine" respectively should be referred to.

Of the details of carriages the following, among others, will be found noticed herein:—Apparatus for showing distance travelled by vehicles, for counting passengers, and for indicating fares; apparatus for lubricating wheels; compositions and materials specially claimed for the construction of panels and carriage bodies and for covering vehicles and the seats, aprons, and dashers thereof; springs and other means of suspension; axles and axletrees; whip sockets and rein holders; windows, blinds, and shutters; lamp irons; brushes for removing dirt from wheels; and guards and couplings.

Special modes of ventilating carriages will be found treated in the series entitled "Ventilation." Lamps are included in the series entitled "Lamps, Candlesticks, Chandeliers, "and other Illuminating Apparatus." Specifications relating to lubricants for axles; gun carriages; steam pumping apparatus for cleaning carriages, &c.; mine trucks and carriages, will be found abridged in existing series, entitled respectively "Oils, Fats, Lubricants, &c."; "Firearms and "other Weapons, Ammunition, and Accoutrements"; "Hydraulics"; and "Mining, Quarrying, Tunnelling and "Well-sinking." Fire engines will be found in the series "Fire Engines, Extinguishers, Escapes, Alarums, &c."

It is obvious that many inventions relating to railway carriages are equally applicable to common road purposes, and *vice versa*. Strictly speaking, therefore, this series and

## PREFACE.

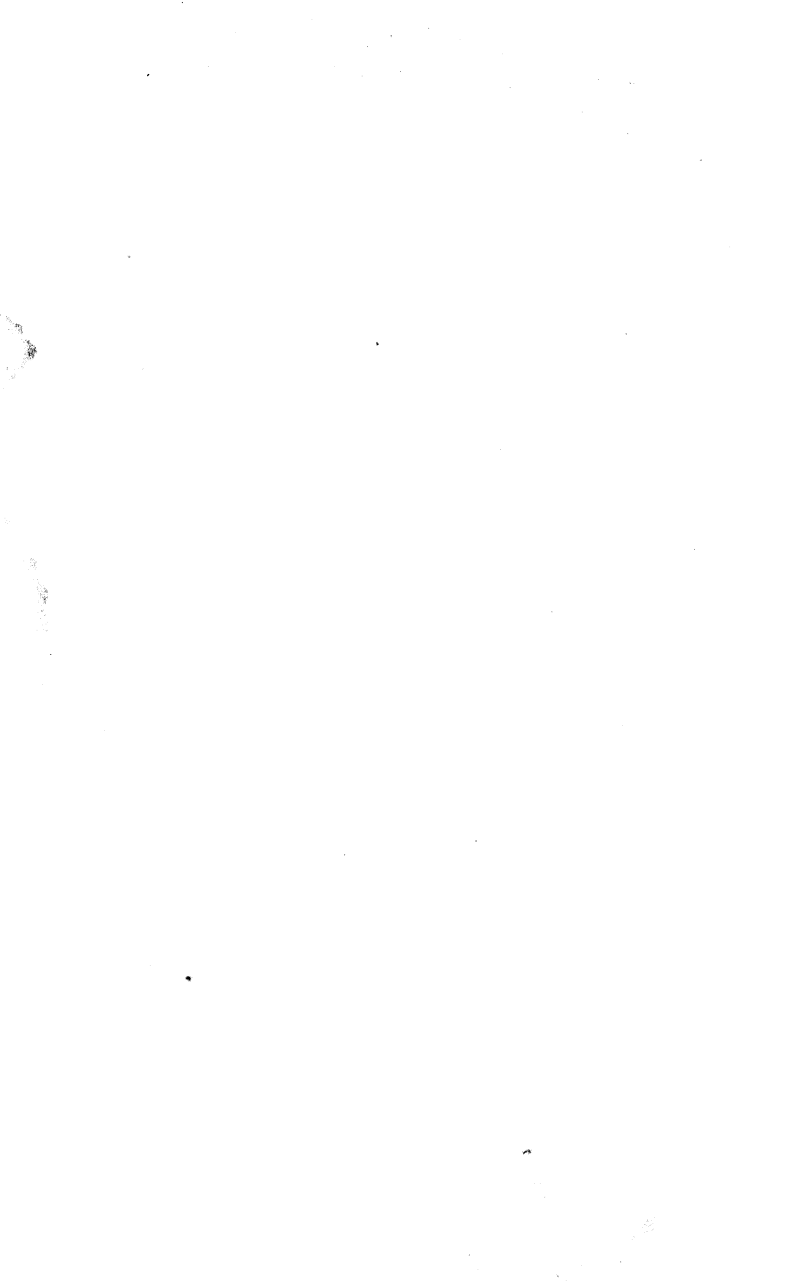
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the series of "Carriages and other Vehicles for Railways" ought to be regarded as supplemental the one to the other.

H. READER LACK.

*June, 1880.*

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# INDEX OF NAMES.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent.]

	Page
<i>Abeillou, J. L.</i> .....	912
Abel, C. D.....	952
Abery, J.....	44
Abraham, H. R.....	523, 586, 602, 621
Abrahams, J.....	978
Ackermann, R.....	168
Adam, G. H.....	482
Adams, R.....	208
——, S.....	866
——, W.....	1034
——, W. B....	274, 288, 322, 336, 405, 414, 558, 566, 648, 896, 1001, 1059, 1205 ( <i>Supp.</i> )
Adcock, J.....	1207 ( <i>Supp.</i> )
Aimont, P. E.....	755
Aitchison, R. K. ....	688
Aitken, W.....	271, 398
Aldebert, J.....	650
<i>Allain, L. A. F.</i> .....	833
Allan, A.....	627
——, T.....	471
Allen, W.....	585
Alleyne, J. G. N.....	1083
Allier, T. V.....	392
Allnutt, H.....	726
Allott, W.....	875
Amies, N. J.....	924
<i>Amuel, J.</i> .....	788, 788
Anderson, Sir J. C....	396, 473, 653, 679, 714, 1194 ( <i>Supp.</i> )
Andraud, A.....	633
Andrews, F.....	212
Anthony, W.....	82

	Page
Apperly, J.....	769
Appleby, C. J.....	1163
Applegath, A.....	254, 255
Apps, J.....	977
Arrowsmith, J.....	488, 850, 1205 ( <i>Supp.</i> )
<i>Artenn, J. F. d'</i> .....	1094
Asbury, W.....	927, 979
Ashberry, P. H.....	1144
Ashbury, J.....	424
Ashdowne, J.....	283
Ashe, F.....	1033
<i>Ashe, W. A.</i> .....	1033
Ashley, J.....	884
Ashton, R.....	1180
Ashwell, J. C.....	774
Askew, J.....	1035, 1075
Astbury, W.....	975
Aston, T.....	565
Atkinson, C. W.....	1093
——, S.....	376
<i>Audineau, J. F.</i> .....	952
Auerbach, M.....	788
Austin, J., 1198, 1203 ( <i>Supp.</i> )	
——, W.....	940
Aveling, T....	947, 1196 ( <i>Supp.</i> )
Avisse, L. A.....	574
Avy, J. E.....	1121
Ayshford, T. B.....	716
Bacon, J. B.....	274
<i>Badaul, G.</i> .....	993
Baddeley, R.....	8
Bailly, N.....	982, 1061

	Page		Page
Balcombe, J. B.....	665	Bell, G.....	423, 565
Ball, J.....	303	Bellford, A. E. L.....	467, 542
Bance, J.....	248	Bellingham, J.....	138
Banfield, J.....	535	Benham, J. L.....	319
Banks, H.....	511	Bentley, D.....	215
——, R.....	160, 168	Berenger, C. R. de.....	107
——, T.....	511	Berg, Sir J. C. van.....	2
Barbor, W.....	67	Bergin, T. F.....	273, 277
Barclay, A.....	899, 958, 1208	Bergue, C. de.....	344, 412, 419
———, J.....	(Supp.) 147	Bernie, A.....	1074
Barker, F.....	993	Berriman, R.....	48
——, J.....	874	Bertrand, I.....	436
Barlow, A.....	8	Bertrand, P. J.....	832
——, R. J.....	270	Besant, J.....	51, 64
Barnes, F.....	1071	Bessemer, H.....	745
Barrans, J.....	749	Bettyes, J.....	822
Barré, J. B. H. H. R.....	798	Bewley, T.....	191
——, J. B. M. E.....	778	Biddell, H.....	1188 (Supp.)
Barrow, J.....	157	Bielefeld, C. F.....	965
Barry, J. R.....	182	Biers, J., junior.....	748
Bartholf, J. H.....	866	Bigelow, L. A.....	836
Bartholomew, C.....	661, 903	Biggs, J.....	668
Bartley, J., junior.....	306	Billings, J. W.....	670
Bates, E.....	473	Binks, H.....	165
Bath, J. P.....	807, 948	Birch, C. L.....	114
Bathias, C. M.....	904	Bird, E.....	476, 499
Bathias, C. M.....	1218, 1221	Birt, T. P.....	208
———, (Supp.)		Bischoff, J.....	1141
Batho, W. F.....	1003	Bishop, J.....	400
Bauer, G. F.....	97	Bissell, L.....	455
Baynes, J.....	177	Black, J.....	574
Beadon, G.....	382, 388, 416	Blackburn, I.....	1193, 1195
Beale, B. B.....	713	———, R.....	1193, 1195, 1211
Beattie, James.....	585	———, (Supp.)	
———, Joseph.....	709	Blackwell, S.....	493
Beaumisnil, P. V.....	655	Blanchet, A. P.....	1215 (Supp.)
Beaumont, G. D. B.....	596	Blanchet, A. P.....	1218 (Supp.)
———, H. B.....	386	Blenkinsop, J.....	131
———, J.....	59	Blockley, T.....	18
———, W. H.....	1049	Blyth, J.....	280
Bedford, S.....	17	Boase, J.....	237
Begbie, J.....	495	Boddy, W. B.....	365
Beggs, J. E.....	820	Bode, Baron H. de.....	574
Béguin, J. F. F.....	983	Bodmer, J. G.....	317, 336
Bell, C.....	930	Boissenot, C. A.....	1170
Bell, C. W.....	501	Bonnall, J.....	975

	Page
Bonneau, J.....	975
Bonneville, H. A.....	967, 938, 988, 1094, 1106
Booth, T.....	722
Bosc, C.....	1170
Bosworth, J.....	124
Bothams, J.....	512
Bottomley, J.....	1033
Botwood, W.....	1153, 1181
Boulay, T. du.....	1068, 1116
Boulnois, W., junior.....	282
Bourne, J. F.....	306
Bousfield, E. T.....	1210, 1214 ( <i>Supp.</i> )
———, G. T.....	666, 695, 905
Bouveiron, H. A.....	347
Bower, M.....	283, 489
Boyd, J. E.....	798
Boydell, J.....	400, 534, 710, 757
———, J., junior.....	366, 1187 ( <i>Supp.</i> )
Boys, E., junior.....	258
Braby, J.....	293, 737
———, J., junior.....	737
Bramah, J.....	120, 139
Bramley, T.....	244
Bramwhite, T.....	404
Brandling, R. W.....	198
Brandreth, T. S.....	206
Brandt, W. G.....	434
Brant, J. C.....	1057
Bräutigam, C.....	1156
Bray, J.....	959
———, W.....	645, 748, 888
———, W. T. G.....	748
Brécheux, E. A. N.....	599
Bréquet, L. F. C.....	696
Brennand, J.....	742, 761
Brett, W.....	1121
Brettell, J.....	1128
———, T.....	1128
Brierley, R.....	1150
Briggs, G.....	565
———, J. G.....	371
Brignon, J. P.....	695
Brine, E.....	99

	Page
Britten, J.....	426, 631
Broad, J.....	651
Brockedon, W.....	406
Brodie, A.....	54
Brooman, C. E.....	1166, 1220 ( <i>Supp.</i> )
———, R. A., 393, 464, 581, 624, 625, 632, 649, 660, 720, 763, 790, 799, 832, 840, 903, 1012, 1023, 1032, 1053, 1100	
Brotherhood, R.....	436
Brown, C. F.....	805
Brown, D.....	532
———, H.....	685
———, H. E.....	797
———, H. R.....	133
———, H. W.....	954
———, John.....	101, 532
———, Joseph.....	505
———, T.....	232
———, W.....	685
Brown, W. H.....	812
Bruckshaw, J.....	1083
Bruet, L. A. J.....	962
Brun, B. E. G. de.....	717
Brunton, W.....	142
Brussant, P. A.....	690
Buchanan, J.....	322, 335
Buck, C.....	524
Buckwell, W.....	442
Bull, M.....	38
Bunnett, J.....	449
Bunting, J. G.....	928
Burch, J.....	483
Burden, W. B.....	961
Burges, G.....	215
———, H. 186.....	186
Burley, W.....	798, 1094
Burness, W.....	1196 ( <i>Supp.</i> )
Burnett, E.....	923
———, J.....	161
Burrell, C.....	743
———, J.....	152
Burrows, J.....	1156
———, W.....	1156
Burstall, T.....	198, 210
Burton, C.....	520

	Page		Page
Burton, R.....	666, 730	Chapman, W.....	10, 141, 1007
Bury, E.....	5...38	Charles, P. P. de St.....	509
Bush, W.....	891, 895	Charnley, H.....	721
—, W., junior.....	153	<i>Charpentier, M.</i> .....	608
Butler, J.....	32	Chattaway, E. D.....	512
—, Samuel.....	14	Chatterton, J.....	497
—, Spilsbury.....	677	Chaufour, J. A. M.....	701
Buyer, J. B. J. de.....	805	Chaumette, J. de la.....	8
Bycroft, B.....	449	<i>Chauseau, U. A.</i> 1220 ( <i>Supp.</i> )	
Byl, P. G. van der.....	930	Chavanes, A.....	545
		Cheffins, A.....	1103
Caan, C. le.....	123	Chellingworth, T. G.....	835, 868
Cabanel, R.....	112	<i>Chilcott, J.</i> .....	527
<i>Cail, J. F. &amp; Co.</i> .....	769	Chinnoek, C.....	393, 414, 932
Caldow, J.....	582	—, F.....	489
<i>Cambon, A. J.</i> .....	815	<i>Chollet, E.</i> .....	1106
Cambridge, F.....	1157	Chrimes, R.....	622
—, W. C.....	644, 671, 741, 1193 ( <i>Supp.</i> )	Christie, J. S.....	440
Campin, F. W.....	759	—, P.....	576
Cannon, C.....	513	Christmas, E.....	966, 997
<i>Caporn, W. G.</i> .....	877	Church, W.....	243, 250, 275
Capstick, W.....	723	Claggett, C.....	36
Cardin, J. J.....	675	Clairmonte, A. J.....	1168
Carey, C.....	617	Clapp, W. H.....	1178
—, S.....	624	Clark, D. K.....	1160
<i>Carfort H. M. J. le N. de.</i> .....		—, G. J.....	171
	1220 ( <i>Supp.</i> )	—, J.....	312, 981
Carмонт, W.....	802	—, W.....	676, 704, 802, 912, 938, 968, 1003, 1043, 1048, 1155, 1182, 1215 ( <i>Supp.</i> )
Carpenter, S.....	872	Clarke, J.....	690, 901
Carpmael, W.....	279	—, T.....	433, 666
Carter, J.....	409	—, W. H.....	851
—, J. M.....	908	Clarkson, T. C.....	606, 992
Cary, W.....	1038	<i>Claustre, A.</i> .....	1053
Castelnau, F.....	995	Clay, H.....	32, 71, 77
Castle, J.....	718	—, W.....	689
<i>Castor, T.</i> .....	820	Clayton, N.....	1197 ( <i>Supp.</i> )
Catterson, J. J.....	520	Clement, J. H.....	592
Cavaignac, G.....	309	<i>Clément, J. H.</i> .....	703
Cayley, Sir G....	1187 ( <i>Supp.</i> )	Clerville, J. J. C. de.....	669
Chambers, E.....	437	Clignett, J.....	4
Champness, J. M.....	165	Clissold, W.....	769
Chaplin, A.....	699	Clive, J. H.....	237
—, W.....	252	Cloake, T.....	754, 793
Chapman, E. W.....	141	Clyburn, R.....	446
—, J.....	291	Coates, C.....	808

	Page
Cochrane, A.....	248
Cocker, J.....	799, 834, 950
Cockings, J. S.....	591
Coffey, J. A.....	954
Coignet, R. P.....	575
Cole, I.....	7
—, M.....	1140
—, R. J.....	818
Coleman, J.....	1122
—, J. E.....	1191 ( <i>Supp.</i> )
Collier, G.....	672, 744
Collinge, C.....	259
—, J.....	57, 70, 128
Collins, B.....	1452
—, S.....	1171
—, W.....	105
—, W. W.....	608
Combe, D.....	490
Condie, J.....	335
Cook, J.....	928
—, J. M.....	985
—, T.....	203
—, W.....	329
Cooke, H. A.....	763
—, T.....	648
—, W.....	107, 885
Cooper, T. W.....	129
Cope, J.....	1018
Corbett, R.....	202
—, W.....	802
Corbitt, W.....	616
Corlett, H.....	530
Corrall, W.....	540
Cottam, G.....	299
Coulson, W.....	558
Couperie, S. A.....	959
Courtauld, S.....	1093
Cowan, W.....	719
Cowing, H.....	441
Cowpe, E.....	1071
Cowper, C.....	438, 765
Crabtree, R.....	228
Craig, H. G.....	1115
—, W. G.....	597, 685
Craigie, J.....	130
Cramer, J. A.....	953
Crane, E.....	783

	Page
Crane, W. T.....	881
Craven, J.....	1053
Crellin, A.....	990
Cresswell, J.....	941
—, R.....	664
Crestadoro, A.....	474
<i>Creuzbaur, R.</i> .....	1141
Crispe, W.....	12
Cristoforis, L. de.....	686
Crofton, M. T.....	637
Croker, B. W.....	715
Crosskill, W.....	377, 530
Cuming, W.....	147
Curtis, J.....	305
—, W. J.....	625, 659, 900, 925
Cutts, J.....	823
Cynelme, L. D.....	33
Daalen, J. van.....	5
Dalgetty, A.....	547
Dalton, J. F.....	111
Dameron, L.....	573, 587
Dance, E.....	784
Daniell, J. C.....	491
Danvers, P.....	670
Darley, W.....	1202 ( <i>Supp.</i> )
<i>D'Artenn, J. F.</i> .....	1094
Darthey, S.....	308
David, L. E.....	796
Davies, D.....	401, 425, 450, 629, 650
—, G.....	1149
—, H.....	346
—, J.....	378
Davis, J.....	55
<i>Davis, J.</i> .....	1219 ( <i>Supp.</i> )
—, M.....	345, 469, 508, 718, 764
—, W.....	876
Day, J.....	278, 1175
—, St. J. V.....	1036
—, W.....	538
Deacon, H.....	638
Death, E.....	917
De Berenger, C. R.....	107

	Page		Page
De Bergue, C....	344, 412, 419	Dimpfel, F. P.....	628
De Bode, Baron H.....	514	Dircks, H.....	331
De Brun, B. E. G.....	717	Dixon, E. J. J.....	462
De Buyer, J. B. J.....	805	Dobbie, J.....	983
<i>De Carfort, H. M. J. le N.....</i>	<i>1220 (Supp.)</i>	Dobbs, A. E.....	1095, 1125
De Clerville, J. J. C.....	669	Dobson, H. A.....	1072
De Cristoforis, L.....	686	Dodds, J.....	324
<i>De Flassieux, —.....</i>	<i>558</i>	——, T. W.....	492
De Fontaine Moreau, P. A. le		Dodge, J.....	894
Comte.....	485, 546, 558, 658	Dodson, A. J.....	462
De Forest, C.....	747	——, G.....	85
De Gablenz, Baron A.....	1147	Doncaster, W.....	152
De la Chaumette, J.....	8	Donovan, R. E.....	1091
De la Fons, J. P.....	491, 516,	<i>Dorlhiac, A.....</i>	<i>1043</i>
	692	Dorman, W. H.....	765
Delannay, A. F.....	775, 853	Dorning, W. J....	1196 ( <i>Supp.</i> )
<i>Delaunay, J. H.....</i>	<i>1182</i>	<i>Douglas, A.....</i>	<i>979</i>
De Lolme, J. L.....	73	Douglas, J. C.....	266
<i>De Maklakoff, N.....</i>	<i>903</i>	Dowling, E.....	559, 774
<i>De Mat, C. J.....</i>	<i>838</i>	Downie, J.....	950
De Mesnil, Baron O.....	1130	Downing, J. W.....	633
<i>Deming, J. H.....</i>	<i>802</i>	Drabble, J.....	1110
De Montferrier, A. A. V. S.		Draper, S.....	674
	523	Dray, W.....	532
Demoulin, L. A. Farjon...	515	Driver, W.....	42
Dempsey, W.....	820	Du Boulay, T.....	1068, 1116
De Nanteuil, P. A. A. de la		<i>Duboy, A.....</i>	<i>625</i>
B.....	1191 ( <i>Supp.</i> )	<i>Dubreuil, J. B. ....</i>	<i>924, 963</i>
De Neviers, A.....	1184	——, P. H.....	924
De Prades, P.....	616	Dubs, H.....	514
<i>Derby, L.....</i>	<i>934</i>	Duckett, G.....	610
De St. Charles, P. P.....	509	<i>Ducoux, F. J.....</i>	<i>1027</i>
<i>De Saint Marc, R. S.....</i>	<i>781</i>	Ducrest, C. L.....	60
<i>Desmarest, H. L. G.....</i>	<i>1074</i>	<i>Ducruix, C.....</i>	<i>1184</i>
De Strubing, Baron, J. U. V.		Dugdale, R.....	311
	439	Duley, J. H.....	879
De Tivoli, V.....	702, 808	Dumarchey, F. F.....	647
Devilliard, P.....	1154	Du Maurier, L. M. B.....	310
Devlan, P. S.....	842, 939	Dumbell, J.....	116, 189
Dewey, L. D.....	767	<i>Duméry, C. J.....</i>	<i>1048</i>
De Wiart, A. C.....	912	Dummere, S.....	1131
De Witte, P.....	1132	Dunbar, G.....	445
Dewsnup, T.....	513	Duncan, C. S.....	410
Dickinson, J.....	811	——, J. W....	1192 ( <i>Supp.</i> )
Dicks, W.....	519	Dunlop, A.....	860
<i>Dickson, P.....</i>	<i>1209 (Supp.)</i>	——, J. M.....	470
		Dunning, R.....	9

	Page
<i>Durand, C.</i> .....	982, 1061
Durant, A. H. A.....	552, 572, 587, 651, 654, 1019, 1054
Dwyer, E.....	1126
Dyer, R.....	422
Eades, R.....	503
Earl, J.....	783
Earp, T.....	1180
Eastman, Z.....	1218 ( <i>Supp.</i> )
Easton, J.....	204
Eaton, R.....	644
Eckhardt, A. G.....	81
Eddy, G. W.....	402
Edge, W. C.....	933
Edgell, J.....	48, 76
Edgeworth, R. L.....	1185 ( <i>Supp.</i> )
Edisbury, K.....	5
Edwards, E.....	488
——, J.....	848
——, T. junior.....	1139
——, W. Y.....	1149
Elliott, G. A.....	1154
——, O.....	95, 102
Ellis, J.....	1162
——, T. J.....	881
Elsdon, W.....	986
Emery, J.....	498
——, R.....	641, 756, 790
Erhard, C.....	655
Esnouf, E.....	538
Etienne, A.....	999, 1030
Etty, T. B.....	668
Evans, D.....	845
——, E.....	422
——, J.....	752
——, J. W.....	1131
——, O. C.....	908
Exall, W.....	403
Eynard, L.....	990
Eyres, J.....	2
Fabien, J. F. V.....	579
Farjon-Demoulin, L. A.....	515
Farnsworth, E. M.....	926
——, J.....	926
Farnworth, J. K.....	1096, 1120

	Page
Farries, A.....	420
Faulds, R.....	946
Fellows, F. P.....	664
Fenton, J.....	830
Ferry, F. J.....	796
Festuz, F.....	996
Findlater, W.....	652
Finnemore, J. B.....	512
Firth, B. W.....	531
Fisher, G.....	442
Fleet, B.....	793
<i>Fleury, A. F.</i> .....	1012
Flexen, S.....	929
Flight, B.....	119
<i>Florin, A. J.</i> .....	696
Fons, J. P. de la.....	491, 516, 692
Fontainemoreau, P. A. le Comte de.....	485, 546, 558, 658
Fontenau, F.....	553
Ford, H. W.....	663
Forest, C. de.....	747
Forrester, G.....	250
Foster, J.....	22
Fournier, A.....	922
Fowler, J.....	911, 1215 ( <i>Supp.</i> )
——, J. junior.....	666, 730
Fox, Samson.....	1053
——, Samuel.....	614
——, S. M.....	1202 ( <i>Supp.</i> )
Francis, J.....	555, 693
<i>Franiel, J. M.</i> .....	1023
Franklinsky, J. A.....	448
Fraser, A. J.....	969
Fraasi, F.....	561
Freeman, S. R.....	1170
Friend, J. W.....	1141
Friou, J.....	777
Froggott, W.....	459
Fry, J.....	643
Fuller, A.....	1073, 1090
——, E. J.....	434
——, S. L.....	1073, 1090
——, T.....	189, 216, 343
——, W. C.....	473, 562, 622, 768
Fulton, H. H.....	668

	Page		Page
Gablenz, Baron A. de.....	1147	Giles, J. W.....	727
Gall, W.....	338	Gilks, C. H.....	643
Gallegos, J.....	837, 842	Gillet, A. W.....	245
Gallis, A. F.....	934	Gillett, S.....	291
Galloway, E.....	290	Gillott, J.....	315
——, G. B.....	1070	Gilman, E.....	1165
Gamble, J.....	697	Giot, P.....	790
——, T.....	697	Gladstone, R.....	900
Gangand, J. B.....	772	Glatard, L.....	856
Garcia, L. Ramon-y.....	1155	Glover, B.....	1044
Gardiner, P. G.....	793, 854	——, F. R. A.....	541, 560
Garn, S.....	598	Goble, G. F.....	1192 ( <i>Supp.</i> )
Garnett, J.....	52	Goddard, K.....	628
Garratt, A. C.....	575	Godfrey, S.....	78
Gaskell, P.....	508, 997	Godsal, P.....	40
Gaudet, J. M.....	550, 561, 577, 590, 598	Gollop, J.....	383
Gaulton, W. P.....	554	Gompertz, L.....	150
Gaury, J.....	341	Goodman, J.....	967
Gautrot, P. J.....	712	——, J. D.....	480
Geach, C.....	433	Goodrich, A.....	1026
Gedge, J.....	608, 689	Goodyear, C.....	585
——, W. E.....	871, 973, 1036, 1054, 1085, 1138, 1164 1220, ( <i>Supp.</i> )	Goodyear, C.....	453
Gee, T.....	841	——, C. junior.....	747
Gellerat, E. and Cie., Société.....	1050	——, Mr.....	468
Genetreau, H. A.....	553	Gordon, A.....	257
Geoffrey, P. J. B.....	582	——, D.....	183, 195
George, Watkin.....	55	——, J. F.....	484
——, William.....	1109	Gore, W. H. P.....	1004, 1019, 1054, 1171
Gerard, J.....	570	Gorrery, T.....	625
German, T.....	93	Gorst, J. R.....	956
Gerner, H.....	549	Gottlieb, V.....	53
Geyelin, G.....	594, 599	Gough, N.....	220
Ghislin, T. G.....	853	——, T.....	675
Gibbs, J.....	252, 254, 255, 268	Gougy, P. F.....	490
Gibson, F. M.....	833	Goupil, E. A.....	1201 ( <i>Supp.</i> )
Gibson, J.....	351	Gourley, D. de la C.....	687
——, J. W.....	962	Gout, R.....	62
Gidlow, T.....	989	Gradwell, D.....	772
Gilbee, H.....	541	——, W. J.....	772
——, W. A.....	756	Grafton, S.....	1009
Gilbert, F. W.....	1089	Graham, A.....	246
——, J.....	1205 ( <i>Supp.</i> )	Gray, G.....	919
Giles, G.....	686, 823	Grayson, W.....	456
——, J.....	794	Greaves, H.....	829
		Green, L. J.....	494
		——, T., junior.....	472



	Page		Page
Greene, J.....	4	Harland, W.....	220
Greenway, C.....	328	Harrington, J.....	1098
Greenwood, J.....	665	Harris, G. S.....	195
Gresham, J.....	873	<i>Harris, J., junior</i> .....	336
Greves, E. T.....	941	Harrison, E. J.....	1058
Grice, J., junior.....	1040	——, W.....	15
<i>Grice &amp; Long, Messrs.</i> .....	825	Harsleben, C.....	281
Griffith, J.....	184	Hart, H. W.....	1160
Griffiths, James.....	1092	——, S.....	180
——, John.....	627	<i>Hartson, G. B.</i> .....	866
——, R.....	471	Harvey, J.....	370
Grime, J.....	300	——, W.....	1173
Grindle, R.....	1167	Haseltine, G.....	923, 934, 1184
Grisenthwaite, W.....	235	Hatchett, J.....	24, 33, 43, 58
Grist, J.....	531, 639	Hathaway, C.....	1202 ( <i>Supp.</i> )
Grundy, A.....	1170	Hawkes, T.....	13
Guillaume, G.....	580	Hawks, G.....	114
<i>Guillet, L. D.</i> .....	1166	Hawksley, G.....	876
Gumbley, J.....	934	Haworth, J.....	955, 1199 ( <i>Supp.</i> )
Gunn, J.....	193	Hayes, J.....	796
Gurney, G.....	201, 218	Hayman, G.....	295
		——, J.....	379
Hackett, J.....	567	Hazard, R.....	355
Haddan, J. C....	412, 453, 607	Hazeldine, C.....	361
Hadley, B.....	1144	——, F.....	1092, 1106
——, C.....	732	——, G.....	444, 570, 637
——, J.....	5	Headlam, T. W.....	821
<i>Haffner, J. P.</i> .....	1166	Heale, E.....	378
Haggett, W.....	906	Heaton, G.....	243
Hague, J.....	296	——, J.....	243
Haines, F.....	605	——, R.....	243, 397
Hall, C.....	477	——, W.....	243
——, W. W.....	212	Hedges, W.....	480
Halladay, S.....	81	Hees, R. van.....	634
<i>Hamoir, G.</i> .....	799	Heffer, G.....	140
Hancock, D.....	7, 1071	Heming, E.....	6
——, J.....	143	Henry, M.....	833, 837, 1027,
——, J. L.....	1117		1050, 1074
——, T.....	393, 406	Henson, W. F.....	810, 847
Hands, S.....	64	Henwood, D.....	480
<i>Handyside, J.</i> .....	1036	Hepburn, F. J. S.....	454
Hanson, J.....	241, 271	Heptinstall, J.....	661, 903
Harcourt, J.....	476	Hernault, P. S. l'.....	494
——, W.....	476	Hewitt, W.....	823
Hardacre, J.....	623	Heycock, W.....	203
Hardy, J.....	267, 276	Heyns, P.....	630, 708
——, R.....	163	Heythuysen, F. M. van....	182

	Page		Page
Heywood, B.....	451	Horrocks, J.....	486
Hick, B.....	265, 268	Houlditch, J.....	111
Higgins, J. L. ....	185, 222	Houldsworth, H.....	332
Hildebrand, A. F.....	861	Houlston, J.....	301
Hilditch, J. B....	1206 ( <i>Supp.</i> )	Howard, J. 1210, 1214 ( <i>Supp.</i> )	
Hill, A.....	3	———, W.....	236
——, C.....	736	Howells, H. C.....	770
——, E.....	380	———, J. C.....	770
——, J.....	198, 210, 894	Howes, W.....	798, 1094
——, T., junior.....	199	Hudson, C. H.....	613
Hillcoat, J.....	22	Huggett, J.....	177
Hilliar, J.....	942, 943	Hughes, B.....	600
Hills, F.....	331, 367	———, E. T.....	870, 973
Hine, H. G.....	621	———, H.....	831
Hipkins, G. F.....	631	<i>Hugon, P.</i> .....	624
Hirst, H.....	203	Hugues, A. A.....	548
——, W.....	203	Humphreys, T.....	491
Hodge, P. R.....	258	Hunnybun, T.....	390
Hodges, R. E.....	541	Hunt, E.....	622
———, W. R.....	648	———, T.....	627
Hodson, W.....	849, 979	Hunter, G.....	205
Hoffman, J. R.....	1048	Hurlock, R. A.....	286
Holbeche, J. S.....	536	Hurn, D.....	1128
Holbrook, W.....	1017	———, G.....	1128
Holden, A. T.....	976	Hurry, H. C.....	442
———, H. A.....	639, 655	Hutchison, W.....	422
Holdway, F.....	603	Hutton, A.....	640
Holfman, J. R.....	1014	Hyde, H.....	731
Holiday, W.....	1076	Hynes, P. S.....	272
Holland, J. H.....	917		
Holliss, C. P.....	1159	Iantowski, J.....	880
Hollond, T. S.....	219	<i>Imhoff, C.</i> .....	973
Holloway, N. J.....	321	Imray, J.....	1162
Holmes, A. E.....	839, 856	Ingledeu, J.....	276
———, H. M.....	572	Ingram, G.....	872
———, R. T.....	1106	Iniff, S.....	1139
Hooper, G. N.....	609	Iremonger, R. J.....	298
———, S.....	63	Isaacs, M.....	192
———, W.....	609, 643	Isherwood, J.....	61
Hopkins, J.....	663		
———, T., junior.....	980	Jackson, B.....	6
Hopkinson, W.....	170	———, B. H.....	7
Hore, W. H.....	1204 ( <i>Supp.</i> )	<i>Jackson Brothers</i> .....	577, 590,
Horliac, L. M.....	284		598
Horne, T.....	420	Jackson, J.....	680
———, W.....	416	———, P. R.....	376, 551
Hornsby, R. junior.....	975	Jacob, J.....	100

	Page
Jacob, J., junior 29, 31, 33, 40	
Jacobs, H. S.....	1081
James, J.....	525
——, S. L.....	1108
——, W.....	26
——, W. H.....	193, 254, 357
Jarvis, W.....	1023
Jean, A. B. J.....	548
Jearrard, R. W., junior....	320
Jenner, G.....	1006
Jennings, J., junior.....	533
<i>Jerrold, J. E.....</i>	820
Jessop, S.....	348
Jochem, P.....	787
Johnson, D.....	173
<i>Johnson, D.....</i>	773
Johnson, D. A.....	833
——, G. F.....	234
——, Jeremiah.....	537
——, Joseph.....	190
——, J. H.....	527, 550, 554, 561, 573, 577, 582, 584, 590, 598, 696, 702, 842, 904, 924, 1065, 1179, 1199 ( <i>Supp.</i> )
Johnston, A.....	352
——, T.....	1146
Jones, B. H.....	1049
——, T.....	211
——, W. A.....	1290 ( <i>Supp.</i> )
Jordan, W.....	39
Josephs, E.....	225
Jowett, H. A.....	781
<i>Jucket, E. B.....</i>	973
Juhel, H.....	910
Julien, M., senior.....	1219, ( <i>Supp.</i> )
Juzet, E.....	786
Katz, G. Ther --.....	694
Keene, M. H.....	1101
Keetley, W.....	652
Kennard, J.....	595
Kerr, J.....	949
Kerruish, E.....	1037
Kesterton, E.....	519
Kettle, J. L. R.....	370
Kincaid, J. S.....	488

	Page
King, R.....	11
Kirkland, J.....	1076
Kirrage, W.....	972
Kittoe, R.....	141
Knappe, E.....	1
Knevitt, G. M.....	473
Knight, W.....	342
Knowles, M.....	229
Kollman, G. A.....	324
Konig, E.....	551
Koster, J. T.....	92, 166
Krupp, A.....	601, 849
Kyle, D. D.....	647
Lacy, H. C.....	212
Ladd, J.....	14
Lake, W.....	889
La Mothe, B. J.....	882
Lamplugh, H.....	1063
<i>Lamur, J.....</i>	1032
Lane, W.....	1082
Lang, L. A.....	644
Lange, J. B. C...1212 ( <i>Supp.</i> )	
<i>Larivière, E.....</i>	1164
<i>Larned, J. G. E.....</i>	787
Latham, J.....	637
Latter, L.....	1176
<i>Laurent, B.....</i>	554
Law, D.....	950
Lawrence, G.....	779
Laycock, T.....	26
Leadbetter, J.....	566
Leahy, E.....	1190 ( <i>Supp.</i> )
——, M.....	761
Leak, E.....	297
<i>Leavitt, C.....</i>	923
Le Caan, C.....	123
Lee, Jesse.....	886, 913, 1207 ( <i>Supp.</i> )
——, John.....	353
——, Joseph.....	864, 878, 931
——, J. D.....	468
——, J. W.....	1032
——, W.....	931
Leedham, W.....	66
<i>Legault, J. B.....</i>	1054
Leighton, Sir E.....	3

	Page		Page
<i>Lenkensperger, G.</i> .....	168	Maberly, F. H....	383, 404, 646
Lenny, C.....	594, 859	———, J.....	151
Lenz, C. F.....	50	McClintock, R.....	942
Leprovost, P.....	968	Macdonald, J.....	1052
Leslie, A.....	922	McDowell, J.....	1022
Leverson, G. B. C.....	506	McIntosh, J.....	1190 ( <i>Supp.</i> )
———, M. R.....	812	Macintosh, J.....	588
Levy, S.....	647	<i>McIvor, W. G.</i> .....	1074
Lewis, G. W.....	538	McKenzie, A.....	1008
———, J.....	95	Mackenzie, A. R.....	1080
———, T. G.....	948	———, P. W.....	927
L'Hernault, P. S.....	494	McKinnel, J. B. A.....	582
Lillie, Sir J. C....	1190 ( <i>Supp.</i> )	McLellan, A.....	308
Lilly, T. E.....	513	Macnee, J.....	302
Lindley, J.....	1122	Macpherson, P.....	670
Lindsay, J.....	201	Macrum, J. M....	1219 ( <i>Supp.</i> )
<i>Lischine, A.</i> .....	1036	<i>Magen, H.</i> .....	557
Lister, S. C.....	424	Maggs, O.....	544
Little, W. A.....	748	Main, J.....	178
Lloyd, H.....	1069, 1113	———, R.....	758
———, J. W.....	100	Mainwaring, W.....	745
———, T.....	941	Maissiat, J. H. M.....	728
Lockett, J.....	87	<i>Maklakoff, N. de.</i> .....	903
Lockie, T.....	883	Mallet, W.....	238
Loggins, W.....	4	Mallett, E. J.....	780
Lolme, J. L. de.....	73	Manby, C.....	693
Lones, E.....	1128	Mannix, J. B.....	818, 846
———, J.....	1128	Mansell, R. C.....	427
———, J. C.....	1128	Manton, W.....	162
Long, J.....	1039	<i>Marc, R. S. de St.</i> .....	781
Longbottom, R. J.....	477	March, J.....	68
Longridge, W. S.....	944	Marchal, D.....	912
Longshaw, J.....	845	Margerison, J.....	526, 675
Longstaff, R.....	771	Markham, C. R.....	1074
Lord, J.....	484	Marsden, R.....	1079
<i>Loubat, J. A.</i> .....	1100	———, W.....	1214 ( <i>Supp.</i> )
Lovely, R.....	486	Marsh, J. H.....	179
Lowe, H.....	746	Marshall, J.....	881
———, J.....	409	———, J. N.....	470
———, T.....	987	———, R.....	1042
Lugg, T.....	11	———, W.....	553
Luis, J.....	727, 772	Marsily, W. E.....	866
Lungley, C.....	717	Martin, C.....	800, 1025, 1060, 1073, 1090
Lusher, D.....	404	———, J. L.....	36
Lyall, J. B.....	453, 605 759	Marvaud, P.....	1079, 1111
Lyde, G.....	63	Marychurch, W.....	627
Lydford, R.....	47		

	Page
Mason, N.....	26
——, R.....	100
——, W.....	201, 214, 240, 249, 279
<i>Massé, D.</i> .....	1138
Massey, E. J.....	283
Massi, C.....	898
Massingham, W.....	481
<i>Masson, M.</i> .....	763
<i>Mat, C. J. de.</i> .....	838
Mathers, R.....	795
Matthews, G.....	41
——, H.....	171
Maude, W. E.....	505
Mauger, E. junior.....	538
Maughan, J.....	333
Maurier, L. M. B. du.....	310
Maw, E.....	709
May, C.....	1188 ( <i>Supp.</i> )
Mayer, J.....	647
Mayes, W. M.....	926
Mead, T.....	1186 ( <i>Supp.</i> )
Meaden, J.....	219
Meakin, J. F.....	668
Meares, R.....	51
Medhurst, G.....	88
Melling, R. junior.....	1021
Mellish, T. R.....	454
<i>Mellor, J.</i> .....	1007
Mennons, M. A. F.....	806, 815
Mesnard, G. H.....	1061
Mesnil, Baron O. de.....	1130
Metcalfe, T.....	385, 556, 560
Meyer, H. C.....	887, 914
——, P. J.....	96
Mickles, P. D.....	773
Middleton, S.....	640
Mill, H.....	6
Miller, J.....	429
——, R. F.....	615, 711
——, S.....	104
Millichap, G.....	178, 266, 382
Millin, G. F.....	984
Millington, J.....	898
Mills, G.....	388
——, J.....	510
——, S.....	507

	Page
Milnes, C.....	852
Milton, W.....	106, 157
Minchin, C. H.....	886
Miniken, T.....	223
Mitchell, R. B.....	1104
Moat, C. W.....	309, 329
<i>Moineau, I. A.</i> .....	988
Molyneux, E. junior.....	936, 1216 ( <i>Supp.</i> )
Monk, W.....	18
Monnin, J.....	1170
Montferrier, A. A. V. S. de.....	523
Moop, H.....	1126
Moor, J. H.....	380
Moore, F.....	27, 30, 46, 49
——, J.....	234
Moreau, F.....	633
——, G. H.....	389
Morel, A.....	970, 1014
Morgan, E.....	893, 1087, 1182
——, E. C.....	841
——, G. H.....	893, 1087, 1182
Morison, J.....	419
<i>Morlet, P. Varney.</i> .....	1036
<i>Morton, E. J.</i> .....	1180
Morton, E. W.....	1180
——, G.....	156
Moseley, J.....	607
Moss, J.....	697
Mothe, B. J. la.....	882
Motley, T.....	433
Mowate, C.....	2
Munns, J.....	71
Munro, J. M. junior.....	678
Muntz, E. G.....	950
Murdoch, J.....	703
——, R.....	667
Murphy, J.....	617
Murray, J.....	294
<i>Murray, J. B.</i> .....	853
Murray, T.....	502
<i>Musgrove, R. N.</i> .....	824
Myers, E.....	584, 607
——, J. J.....	1219 ( <i>Supp.</i> )
Nanteuil, de, P. A. A. de la B.....	1191 ( <i>Supp.</i> )

	Page		Page
Napier, D.....	246	Ogilby, B.....	5
——, G.....	612	O'Keefe, O.....	20, 21, 34
——, J.....	246	Oldershaw, A. P.....	659
——, W.....	246	O'Leary, J.....	489, 493
Nasymith, G.....	643	Olive, J.....	597
Neall, G.....	910	——, W.....	597
Needham, S.....	841	Onions, W.....	455
Nelme, L. D.....	33	Orange, E. B.....	814
Neviers, A. de.....	1184	Orlowski, V.....	936
Neville, J.....	213	Osborne, C. S.....	1145
Newall, J.....	481, 529	Overend, H.....	80
——, R. S.....	431	Overton, T.....	19
Newbould, W.....	1057	Owen, W.....	324
Newcome, A.....	38	Oxley, J.....	568, 716, 740, 915
Newman, C.....	181		
——, J.....	583	Palin, W.....	4
Newton, A. V.....	484, 549, 554, 719, 769, 776, 820, 835, 870, 926, 955, 1184	Palliser, G.....	394
——, H. E.....	1089	<i>Palmer, G. T.</i> .....	527
——, H. V.....	443	Palmer, G. V.....	250
——, M.....	478, 500, 517	——, H. R.....	349
——, W. E.....	364, 369, 465, 466, 496, 542, 669, 704, 710, 730, 783, 805, 814, 820, 877, 1099, 1209 ( <i>Supp.</i> )	——, W.....	137, 515
Nicholson, W.....	136	Panter, W.....	164
——, W. N.....	546	Pape, J. H.....	349
Nicolas, J. L.....	327	Paradis, J.....	439
Nicole, A.....	1123	Paraire, E. L.....	858
Noble, W.....	672, 744	Parfitt, A.....	522
<i>Noël, C.</i> .....	968	Parfrey, Y.....	503, 863
North, G.....	598	Parker, Francis.....	662
——, R. S.....	791	——, Frederick.....	614, 945
Norton, C.....	698	——, R.....	226, 244
——, J.....	62, 463	Parkin, T.....	314
——, J. L.....	514	Parlby, J.....	706
Nottingham, J. W.....	961 991, 1004	——, S.....	373
Nunn, H.....	577	Parsons, G.....	778, 807, 828
Nurse, J.....	504	——, P. M.....	522
		Partridge, E.....	757, 801, 812, 844, 863, 1064
Oates, J. P.....	475	Paterson, A. J.....	1197 ( <i>Supp.</i> )
O'Brien, D.....	1091	Paton, T.....	117
Ockerby, F.....	1174	Pattinson, H. L., junior.....	566
Offord, J.....	562, 907	Paul, R.....	180
——, R. junior.....	827, 843	Payne, J. J.....	507
		——, M.....	1039
		Peacock, D.....	817
		Peake, T.....	830
		Pearce, G.....	663
		Pearse, J.....	239, 247, 297

	Page		Page
Pearson, R.....	287	Poupard, W.....	750
Pease, T.....	18, 23	Powell, H. B.....	390
Peek, W. B.....	338	Pownall, C. J.....	437
Peillon, —.....	558	Pradel, P.....	938
Pennington, J.....	1111	Prades, P. de.....	616
Pensam, J. T.....	874	Pratt, M.....	1186 ( <i>Supp.</i> )
Peppercorne, G. R.....	299	—, S.....	188
Perratone, C.....	769	Préaud, J. M.....	601
Perry, J. G.....	1184	Prentiss, E. F.....	920, 1201
Peterson, C.....	972	( <i>Supp.</i> )	
Petin, H. U.....	550, 561, 577, 590, 598	Preux, A. E.....	628
Phillips, P. W.....	338	Price, E.....	1135
Phillips-Smith, J.....	1165	—, V.....	427
Phipps, G. H.....	342	Prior, W.....	318
Piatti, F.....	1099	Prioux, E. T....	1220 ( <i>Supp.</i> )
Piault, J.....	814	Prosser, W., junior...	370, 382
Pichler, F.....	786	Puckering, R.....	1148
Pickering, J.....	27	Pugh, J.....	771
Pickford, M.....	187	Pullan, A.....	771, 889
Pickin, R.....	897	Pyke, T.....	199
—, W. E.....	897	Quaintain, L.....	262
Pidding, W.....	408, 460, 800	Quetin, L.....	230
Pierson, J. G.....	264	Quinche, A. J.....	653
Pinaud, J.....	1061	Quitzeu, A.....	1089
Pinkus, H.....	1188 ( <i>Supp.</i> )	Raggett, G.....	656
Pinney, J.....	1210 ( <i>Supp.</i> )	Rainey, T.....	870
Piper, T.....	334	Ralli, P. T.....	362
Pitt, C.....	154	Ramon-y-Garcia, L.....	1155
Pitts, J. L.....	746	Ramsey, D.....	2
Playfair, W.....	45	Randolph, D. M.....	121
Playle, T.....	698	Raney, T. S.....	1105
Plum, T. W.....	791, 1005	Rankin, P. S.....	618
Pocock, G.....	211	Ranking, J.....	191
Poirier, Z.....	1061	Ransley, J.....	766
Pollock, J.....	779	Ransome, R.....	1188 ( <i>Supp.</i> )
Pomme, L. J.....	528	Ranwell, W.....	368
Poole, J.....	16	Rathen, Baron A. B. von...	534
—, M....	235, 286, 312, 316, 319, 381, 389, 444, 468	Rawe, J., junior.....	237
Pope, F.....	334	Rawlings, J.....	793
—, W.....	155, 207	Rayner, H. S.....	384
Portus, J.....	629	Raywood, J.....	1192 ( <i>Supp.</i> )
Postweiler, A.....	1154	Read, G.....	1091
Pottinger, R.....	94	Reading, D....	499, 661
Potts, F.....	591	Reddell, J. H.....	89, 90
Poulson, E.....	843	Redmund, D.....	261

	Page		Page
Reedhead, J.....	257	Rock, J.....	892, 1118
Rees, D.....	260	——, J., junior.....	446, 619, 1136
Reeves, C.....	28	Rodgers, J.....	1009
Reiley, J., junior.....	700	Rogers, T.....	10, 140
Reinagle, R. R.....	284, 590	Rolfe, A.....	960, 989
Remington, G.....	665	Romaine, R.....	683, 735, 1294 ( <i>Supp.</i> )
Rennie, T. W.....	1146	Roosevelt, C.....	507
<i>Rey, J. M., junior</i> .....	870	Rothwell, P.....	1077
Reynolds, G. W.....	784	Rouse, W.....	375
——, J.....	157	Routledge, T.....	290
Rice, W.....	1055	Rowan, J. M.....	725
Richard, J.....	494	——, W.....	372
Richards, A. K.....	974	Rowe, J.....	11
<i>Richards, A. K.</i> .....	1101	——, S. R.....	1119
Richards, J.....	1167, 1200 ( <i>Supp.</i> )	Rowland, I.....	1209 ( <i>Supp.</i> )
——, R.....	1046	Rowley, G. W.....	413
Richardson, G.....	683, 706	Rowntree, T.....	102
——, H. F.....	327	<i>Roy, E.</i> .....	584
——, J.....	1146	Russell, G. F.....	1124, 1137
——, R.....	414	——, W.....	768
——, W.....	683, 706, 852	Ruthven, J.....	174, 238
Rickards, J. B.....	838	Ryder, S.....	199
Rickett, T.....	729, 819	Rye, W.....	577
Riddell, T.....	724		
——, W.....	1088	Sager, W.....	431
Riddle, G.....	334	St. Charles, P. P. de.....	509
Ridges, J. E.....	874	<i>St. Marc, R. S. de</i> .....	781
<i>Riend, A.</i> .....	311	Salmon, P.....	1067
Riley, Z.....	224	Salter, R. G.....	426
Rimmel, E.....	557	Samuel, J.....	815
Rimmer, J.....	939	Samuelson, B.....	735
Ringsted, W.....	16	Sanderson, T.....	658
Rishworth, C.....	703	<i>Sargent, C. W. H.</i> .....	967
<i>Rives, M.</i> .....	910	Saunders, J.....	372, 504
Roberts, James.....	99	——, R.....	1213 ( <i>Supp.</i> )
——, John.....	539	Savage, R. W.....	678
——, Joseph.....	148	——, W. P.....	762
——, J., junior.....	174	Savill, H.....	4
——, M. J.....	982	Saxton, J.....	256
——, R.....	253, 620	Schiele, C.....	432, 524
——, R. P.....	953	Schmoock, J.....	544
——, T. H.....	1066	<i>Schroder, E.</i> .....	788, 788
——, W.....	1015	Scotson, E.....	721
Robertson, J.....	731	<i>Scott, F.</i> .....	820
<i>Robinson, C.</i> .....	767		
Robotham, S.....	938		
Robson, S. S.....	629		



	Page
Scott, U....	457, 571, 588, 626 753, 1133
——, W. C.....	455, 486
Scowen, T. L.....	656, 1020
Sculthorpe, G. K.....	229
Searby, W.....	691
Seaton, T.....	204
Seaward, J. 223, 1187 ( <i>Supp.</i> )	
——, S. 223, 1187 ( <i>Supp.</i> )	
Seely, S. J.....	835
Selby, F.....	890, 1207 ( <i>Supp.</i> )
Seton, C.....	785
Shakespeare, H. J. C.....	682
Shankster, J.....	49, 56
Sharples, J.....	66
Shaw, A. R.....	1114
——, G.....	616
——, H.....	1096
Shepard, W. A. 1204 ( <i>Supp.</i> )	
Sherwood, J.....	657
Shillibeer, G.....	344, 686, 823
Shoner, J. F.....	691
Shorter, E.....	82, 164
Shuttleworth, J. 1197 ( <i>Supp.</i> )	
Siever, R. W.....	1046
Silvester, E.....	136
Simon, G.....	491
<i>Simon, J. L.</i> .....	806
Simonton, J.....	867
Simpson, H. C.....	865
——, J.....	409
——, W.....	277
<i>Singer, I. M.</i> .....	776, 1149
Skeldon, P.....	1045
Skelley, J.....	579, 712
Skertchley, J., junior.....	545
Skidmore, J.....	51, 85
Slagg, R.....	209
Slater, J.....	224
Slaughter, E.....	348
Slawson, J. B.....	686
Smith, Alfred.....	746
——, Andrew.....	416
——, F. H.....	589
——, H.....	389, 410
——, John.....	175, 495, 594
——, Joseph.....	933

	Page
Smith, J., junior.....	727
——, J. O.....	782
——, J. Phillips—.....	1165
——, O. H.....	503
——, S. W.....	927
——, T.....	386, 869, 983
——, W. H.....	332
Smithson, T. A.....	482
Snell, H. S.....	679
Snelling, A. R.....	494
Snider, J., junior.....	935
Snowden, W.....	161
——, W. F.....	196
<i>Société des Forges of Mont-</i> <i>taire</i> .....	840
<i>Société E. Gellerat &amp; Cie.</i> .....	1050
Soloman, S.....	507
Somerton, W.....	37
Southgate, T. L.....	1021
Sovereign, L. L.....	1124
Speed, J. J., junior.....	595
Spencer, G.....	510, 848, 1220 ( <i>Supp.</i> )
——, J., junior.....	852
——, M.....	852
——, T.....	743
Spinks, J., junior.....	361
Spong, W.....	217
Spratley, W.....	145
Stableford, W.....	879
Stafford, D.....	197, 310
Startin, T.....	1078
Statham, H.....	1152
——, J.....	360
Stead, J.....	159
Steevens, W.....	1035
Stephens, J.....	813
——, R.....	1117
Stephenson, R.....	208
Steven, T.....	722
Stevens, B. F.....	862
<i>Stevens, S.</i> .....	862
Stewart, T.....	838
<i>Stilmant, P. L. A.</i> .....	833
Stirling, P.....	790
Stocken, F.....	588, 913
Stockler, A. R.....	871

	Page		Page
Stocker, A. S.....	546, 831, 871	Thomas, W.....	919
Stokoe, T.....	25	Thomason, E. ....	79, 83
Storer, T.....	751	Thompson, G. A.....	132
Stoy, H.....	535, 550	———, J.....	13, 185
Stracey, E.....	118	Thomson, R. B.....	1011
Stratton, B. T.....	412	———, R. W.....	391
Strubing, Baron J. U. V de	439	———, W.....	593
Stubber, N.....	1044	Thonet, F.....	804
Stubbs, F. H.....	1211 ( <i>Supp.</i> )	Thornber, J. B.....	720
Sulton, A.....	940	Thornhill, E.....	10
Surgey, J. B.....	563	Thurlow, J.....	835, 868
Swift, F.....	604, 1041	Thurnham, C. H.....	736
Swinburne, T.....	1103, 1189	Tiffin, C., junior.....	1177
( <i>Supp.</i> )		Tigar, P.....	265
Swinton, W.....	39	Tindall, T.....	150
Symes, J.....	1017	Tivoli, V. de.....	702, 808
		Tolhausen, F.....	993
Tabernacle, G.....	434	Tomlinson, J.....	1024
Tabuteau, A.....	871	Tongue, C.....	267
Taillendeau, A.....	1085	Townsend, W.....	564
Tait, J.....	1146	Train, G. F.....	803, 815, 824, 825
Tall, J.....	707	Travis, J. S.....	816
Taplin, B. D.....	864, 878	Tredwell, R.....	17, 19, 20, 24
Tasker, W.....	1007	Trengrouse, J.....	8
Tate, J.....	98	Trevithick, R.....	96
Taylor, J. N.....	394	Triat, A. H.....	1189 ( <i>Supp.</i> )
Taylor, G.....	869	Truemen, W.....	746
———, James....	741, 798, 809	Truman, T. R.....	817
———, John.....	131	Tull, J.....	12
———, Joseph.....	413	Turner, E. R.....	1034
———, J. G.....	677	———, F.....	1034
———, Walter.....	35	———, W.....	86, 962
———, William.....	135	Turrill, F.....	158
Teissier, J. B. S...1189 ( <i>Supp.</i> )		Tyerman, T. F.....	614
Tenting, J. L. aisé.....	783	Tyson, T. S.....	876
Tenting, M. aisé.....	756		
Testuz, F.....	1013	Ullrich, L.....	591
Thatcher, C.....	354	Underhill, W. S.....	1083
———, T.....	354	Underwood, W.....	520
Thelwall, J.....	875	Upfill, W.....	927
Ther-Katz, G.....	694	Uster, H. L. T. T. von.....	395
Thiercelin, E. E.....	1179		
Thirion, A. L.....	912	Van Berg, Sir J. C.....	2
Thomas, Rebecca.....	812, 840	Van Daalen, J.....	5
———, Robert.....	304	Van der Byl, P. G.....	930
		Van Hees, R.....	634

# INDEX OF NAMES.

xxv

	Page		Page
Van Heythuysen, F. M.	182	Webster, J.	451, 476, 782
Varley, J.	339	Welch, A.	792
<i>Varney-Morlet, P.</i>	1036	——, E.	476
Varty, J.	126	——, J.	680, 705, 714
Vaughan, P.	76	<i>Welch, J.</i>	792
Vazie, R.	109	<i>Wells, R. T. M.</i>	1065
Venden, E.	390	<i>Wendell, I. P.</i>	702
Vercher, J. A.	796	——, J. L.	702
Vernon, C.	1128	Wessely, C.	921
Vezey, E.	576	Westhead, M. B.	1108
——, R.	576	Weston, J.	294
Viney, J.	211	Wharton, W.	432, 882, 1015
Vingoe, H.	373	——, W. jun.	1199 ( <i>Supp.</i> )
——, W. H.	373	Wheatley, F.	458
Violette, F. C. M.	369	——, J.	127
Vivian, A.	96	Wheelhouse, T.	665
Von Rathen, Baron A. B.	534	Whitbourn, J.	187
Von Uster, H. L. T. T.	395	Whitby, T.	820, 1158
Vulliamy, B.	69	Whitcher, J.	187, 289
		White, G.	137
Wagstaff, R.	673	——, W.	706, 776
Walker, G. J.	477, 729, 1169	Whiteside, R.	269
——, J.	1056, 1151	Whitfield, W.	148
——, J. C.	1102	Whitgrove, J. T.	847
——, T.	315, 388, 433	Whittle, W.	583
——, W.	336	Whytock, A.	713
Wall, E.	176	Wiat, A. C. de.	912
Wallace, T.	635	Wigley, H. J.	786
Waller, R.	370	Wigzel, M.	891
Walles, J.	2	Wildey, H.	30, 72, 84
Walsh, J. H.	609	Wilkey, J. F.	359
Walter, R.	1004	Wilkinson, S.	203
Walthew, F. J.	1000	Wilks, C.	142, 145
Warburton, T.	1115	Willcock, J.	787
——, W.	356	Williams, C. J. B.	311
Warcup, W.	503, 547	——, J.	97, 115, 126, 650, 1168
Ward, E.	518	——, P.	242
——, H.	672	——, P. H.	859
——, J. T.	611, 964	——, T.	613, 975
——, W. H.	1216 ( <i>Supp.</i> )	Williamson, J.	1122
Warner, A.	1151	Wilmot, S. R.	979
Watkins, J.	771, 856	Wilson, A.	806
Watson, A. T.	862, 869	——, E. B.	791
Wayne, J. B.	657	——, F. J.	497
Webb, T.	1212, 1215 ( <i>Supp.</i> )	——, G.	533
Webster, A.	586	——, H.	957
<i>Webster, H.</i>	586		

	Page		Page
Wilson, J.....	642	Worssam, S.....	639
——, J. G.....	483	Wren, J. W. C.....	584
——, T.....	558, 1029	Wrigg, H.....	402
——, W. G.....	385	Wright, James.....	781, 853
Winans, R.....	227	——, John.....	14, 625
Winby, C. E.....	1138	——, Joseph.....	340, 379
——, F. C.....	1138	——, L. W.....	221
——, W. E.....	1015	——, P.....	857
Witte, G. de.....	1132	——, S.....	1086, 1097
Witty, R.....	245	——, S. W.....	209
Wolferstan, T.....	365	——, T.....	340
Wood, T.....	400	Wrigley, T.....	1108
Woodall, J. F.....	902	Wycherley, H.....	951
Woodbury, J. P.....	1112	Wyke, G.....	122, 164
<i>Woodbury, S.....</i>	<i>955</i>		
Woodruff, R.....	852	Yarrow, A. F.....	1206 ( <i>Supp.</i> )
<i>Woodward, J. M.....</i>	<i>905</i>	Yates, J.....	60
Woollams, J.....	188	Young, F.....	620
Worby, W.....	1188 ( <i>Supp.</i> )		
Worcester, E., Marquis of...2		<i>Zempliner, W. A.....</i>	<i>689</i>

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**CARRIAGES AND OTHER VEHICLES  
FOR COMMON ROADS.**

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# CARRIAGES AND OTHER VEHICLES FOR COMMON ROADS.

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A.D. 1625, January 7.—No. 31.

KNAPPE, EDWARD.—Improvements in carriages, consisting in “Divers newe wayes and meanes by which coaches, carroaches, cart<sup>℥</sup> and other carriag<sup>℥</sup> maie bemade to last and contynue longer to goe with more ease to the parties that shall use them and the beastes that shall drawe them and be kept and maynteyned with less charge then such like have heretofore beene in the ordinarie courses formerlie vsed, that is to saie by makeinge the axeltrees of iron, brasse, or steele, either of one length fixed to the one wheele and boxed in the other, or of two lengths fixed severally in either wheele, and boxed vnder the bodie of the carriage, whereby all charge of clowting wilbe saved, and the wheelles and axeltrees to be soe placed and contrived as in an instant of tyme the wheelles maie be shutt closer together where the narrownes of the waie shall require itt without anie daunger or to be enlarged and sett wyder as shall be most safe and easey for the passenger, and with a devise whereby the coachman without comying from his boxe shall in anie descent of grounde keepe the hinder wheelles from turninge soe as the carriage shall goe downe hill with noe more hurt or danger to the passingers or horses then in playne ground, as alsoe by hanginge the bodie of the coach or caroach to the carriages by two springes of steele before & two behinde, for the more ease of the treveller, and savinge the dayly charge of grease vsinge oyle in steede thereof.”

[No Specification enrolled. Letters Patent printed, price 4d.]

A.D. 1634, January 29.—No. 68.

RAMSEY, DAVID.—These letters patent were granted for, among other objects, “a farre more easie and better waye for  
“soweing of corne & grayne, & allsoe for the carriage of  
“coaches, carts, drayes, & other thinge going on wheelles,  
“then ever yet was vsed and discovered.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1634, December 19.—No. 77.

EYRES, JOHN, MOWATE, CHARLES, and WALLIS, JOHN.  
Waterproofing woollen cloth for covering coaches, &c.

The title thus describes the invention:—“Seacret waies  
“and meanes not heretofore vsed within any of our dom-  
“ynions whereby to make woollen cloth impenitrable of rayne  
“which would be very comodious for our subiecte, as well  
“for journyeing and the p̄servaçon of their healt̄he, as  
“allsoe for saving of much leather that nowe is wasted in  
“covering of coaches and waggons for that the said  
“covering of clothe will keepe out wet as well as a covering of  
“leather and wilbe lighter for horses to travaile withall.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1636, April 27.—No. 92a.

VAN BERG, Sir JOHN CHRISTOPHER.—These letters patent comprise a number of improvements among which are specified the following:—“Instrumente, partly mathematicall,  
“partly mechanicall, serving for the accurate measuring of  
“land or ground, and may alsoe in a certayne manner bee  
“ymployed to coaches, cart, waggons, or any other thinge  
“that is moved from place to place, thereby to knowe the  
“exacte distance and dispatch of their moçõn.” “Alsoe in-  
“vençõns of all kinde of wagons, waynes, coaches, carts,  
“litters, wheelebarrowes,” &c.

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1660, February 8.—No. 131.

WORCESTER, EDWARD, Marquis of.—One of the inventions covered by this patent has reference to improvements in carriages, and is thus described:—“An invençõn to make an



“ engine applicable to any coach by which a child of six yeares  
 “ old may secure from danger all in the coach, and even the  
 “ coachman himselfe, though the horses become never soe  
 “ unruly the child being able in the twinkling of an eye to  
 “ loosen them from the coach in what posture soever they  
 “ drawe or turne be it ever soe short or to either hand.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1664, March 3.—No. 143.

HILL, ABRAHAM.—This patent relates partly to “makeing  
 “ of a carriage, chaire, coach or charriott with twoe wheeles  
 “ vpon one axletree, haveing a seate or chaire sett vpon  
 “ two shafts or peirches, one end resting vpon the axel-  
 “ tree, the other vpon the horse; and of another sorte of  
 “ carriage, chaire, coach, or charriott which hath twoe or  
 “ more such shafts or peirches with foure wheeles; and of  
 “ another sorte of carriage, chaire, coach, or charriott which  
 “ hath a seate or chaire placed vpon two wheeles or more,  
 “ whereof twoe move on the end of a crooked aleltree, with  
 “ rollers or otherwise; and of another sorte of a carriage,  
 “ chaire, coach, or charriot haveing the seate or chaire hung  
 “ vpon long springs before and behind; and of another sorte  
 “ of carriage, chaire, coach, or chaires which hath the seate  
 “ or chaire placed upon winding springs fastened to the pearch,  
 “ or to the axeltree, and winding about the same.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1667, July 3.—No. 153.

LEIGHTON, Sir ELLIS.—This invention relates to an engine  
 for propelling carriages which is thus described:—“A cteine  
 “ engine w<sup>ch</sup>, wrought & disposed into the bodyes and car-  
 “ ryages of waggons, charriotts, coaches, and all sorts of  
 “ things w<sup>ch</sup> are vsed for carrying of persons and burthens  
 “ from one place to another by land, will facilitate to the  
 “ moçôn of all these things, that it will extreamely save the  
 “ toyle and labour both of men and horses and soe conse-  
 “ quently pforme their severall vses with lesse expence.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1683, November 15.—No. 229.

PALIN, WILLIAM, and LOGGINS, WILLIAM.—“A new invention of making severall things of iron by millwork only, which were and are now done by hand and hammer, (as streaks or tires for wheels)” &c.

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1684, June 19.—No. 236.

CLIGNETT, JOHN.—“A new devise or engine much like a callash, with two or more wheels, not subject to overturning, wherein one or more may travell with great ease and safety, in which particulars it differs from any coach or callash hitherto made or invented.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1685, November 30.—No. 248.

SAVILE, HENRY.—“A new invention for the great improvement, both as to ease and use of all sorts of carts, waggons, and carriages whatsoever going upon two wheels, by applying a third wheele, with other additions entirely new.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1691, April 13.—No. 267.

GREENE, JOHN.—“This invention relates to hanging coaches &c., and is thus described:—A new carriage and way of hanging coaches and charriots, which for ease and safety of riding, turning in narrow streetes or lanes, and manner of coachman's setting differs from and exceeds all that were ever yet made or invented; and notwithstanding the rough and unevenesse of any pavements or road the riding will be very neare as easie as in a chaire or sedan and altogether as safe, the body hanging perpendicular though the wheels should overturn.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1691, June 12.—No. 269.

GREENE, JOHN.—“New engines or carryages of certaine shapes and measures to be drawne or driven by man or

“ beast vpon one or more wheeles, wherein the lading is  
 “ carried about with every revolution of the wheele, which  
 “ for ease of the burthen or draft and labour exceeds all others  
 “ that were ever yett invented or vsed being of great benefitt  
 “ and service to the publike.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1691, October 1.—No. 277.

EDISBURY, KENDRICK.—“ A new art or invention of certaine  
 “ rollers to be vsed vnder the bodies of carriages, carts, and  
 “ waggons instead of wheeles, which will be farr more  
 “ vseful than wheeles, by amending & preserving as well  
 “ the high wayes as private grounds.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1693, March 3.—No. 315.

HADLEY, JOHN.—Among the inventions comprised by this  
 patent is one described as “ an invention of egines moved by  
 “ wind, vsefull for drawing severall machines & carriages  
 “ instead of horses.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1697, April 21.—No. 350.

OGILBY, BARTHOLOMEW. — Preventing overturning. The  
 Letters Patent describe the invention as consisting of “ an  
 “ engine which will prevent the overturning of any sort of  
 “ carriages, whether coach, carte, or waggon, makeing them  
 “ goe much lighter and easier, and keeping them in the same  
 “ scituaçon both vp hill and downe even in the worst roads.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1698, February 25.—No. 353.

VAN DAALEN, JAMES. — This invention is described as  
 relating to an “ engine or carriage with four wheeles and  
 “ double troughes, which open in the middle and shoot out the  
 “ load at once, and returne into their places againe, which  
 “ is wrought together with steelings and schrages or stages  
 “ that are removed and wrought either with or without  
 “ wheeles.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1699, June 20.—No. 364.

HEMING, EDMUND.—Among other inventions comprised by these Letters Patent is “a new invençon very vseful for all  
“ our artillery carriages, waggons, and carts, and all coñon  
“ carts and waggons vsed in our Dominions.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1704, April 8.—No. 370.

JACKSON, BENJAMIN.—Hanging coaches &c. “A new way to order coaches, calashes, chazes, wagons, and other carriages  
“ and machines of that nature, so that although the wheelles  
“ or carriages may be oversett, yet the bodies or boxes of  
“ them shall still remaine vpright without danger to those  
“ that sit in them.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1706, April 12.—No. 376.

MILL, HENRY.—Springs for carriages. “A new mathematicall  
“ instrument consisting of new sorts or kinds of springs for  
“ the ease of persons riding in coaches, chariotts, calashes  
“ and chaises, absolutely differing from the springs now  
“ vsed, which are placed below at the corners of coaches,  
“ chariotts, and calashes this being made to be placed and  
“ fixed vnto, betweene, and within the main leather braces,  
“ by which the bodyes of coaches, chariotts, calashes, and  
“ chaises are hung, being likewise inviron’d or encompassed  
“ with the said leather braces, and being placed or fixed in or  
“ very neare the middle of the said braces, forcing them  
“ in their vse and operation to open somewhat like a rhombus  
“ or lozenge; and that the said new invented springs are  
“ made and contrived of several forms vizt.:—Semicircular,  
“ circular, angular, ovall, or of various other forms, a small  
“ iron rodd or pinn running thro’ the middle or extremities  
“ of the same springs, and may be putt on or taken off at  
“ pleasure in the space of halfe an hour; and which invençon  
“ is very much lighter than the said springs now in vse, a  
“ sett of those generally weighing about 120 pounds and a  
“ sett of these not exceeding 20 pounds weight and may be  
“ sold at farr lesse charge.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1707, September 10.—No. 381.

COLE, JOHN.—Drawing coaches, &c. The invention is thus described by its title :—" Certain new method<sup>e</sup> and ways for  
 " more easy drawing any burthens in & vpon coaches,  
 " waggons, carts, drays, dung carts, waines, or any other  
 " carriages vpon wheels, than any other method hitherto  
 " practised or vsed."

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1711, November 13.—No. 389.

HANCOCK, DANIEL.—Axle boxes. The inventor thus describes his improvement :—" Makeing a more vseful sort of  
 " iron boxes for the wheeles of all manner of carriages,  
 " called open boxes; vizt., one sort of boxes called the body  
 " box, which, haveing the edge next toward<sup>e</sup> the lime pin  
 " cyphered off, does not bear close upon the clout of the axle-  
 " tree, but lyes hollow or open to prevent cutting the clouts,  
 " and for the better receiving of the grease, which renders  
 " the rotation of the wheel more easy, and one other sort  
 " with both edges cyphered off, co only called the lime  
 " box; that the said invention may be of great vse to the  
 " publick in rendring the rotation of the wheeles of all  
 " manner of carriages more safe and easy, and in preventing  
 " those ill accidents which frequently happen from the sort  
 " of boxes now in vse by their cutting, breaking, and some-  
 " times firing their axeltrees."

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1715, May, 5.—No. 399.

JACKSON, BENJAMIN HABAKKUK. — Hanging coaches, &c. This invention is thus described by its title :—

" A very needful invention for the makeing and altering of  
 " coaches, chariott<sup>e</sup>, callashes, and other machines of that  
 " nature in such a manner that the persons who sit in them  
 " will be in no danger of receiving any damage though the  
 " wheeles should be ever so suddenly oversett, because the  
 " bodies of them will always in such cases at the very same  
 " remain in an vpright position, equivalent to an horizontal  
 " levell, and they will be likewise on the same level when

“ going on the side of a hill, and in the most rugged and  
 “ vneven roads.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1717, July 17.—No. 415.

TRENGROUSE, JAMES. —Improvements in carriages, thus described :—“ Divers sorts of new vehicles or wheel carriages  
 “ that will not overturne in any roads, the like never before  
 “ made, and that the same will be very profitable to all  
 “ persons who vse any wheel carriages, and will not fret the  
 “ road<sup>e</sup> as waggons and other such carriages now do, that  
 “ he calls some these new vehicles double and single runners,  
 “ that the double runners will travell in such bad roads as no  
 “ coach can travell in, and will run more miles a day and  
 “ with fewer horses, with more passengers and in lesse time  
 “ than the present coaches can, and will accomodate all  
 “ passengers, with several useful conveniencys; that he hath  
 “ also invented diverse new machines or engines which will  
 “ prevent all coaches, waggons, and other wheel carriages  
 “ from overturning, with several conveniences for servants  
 “ and cloathing for horses.”

[*No Specification enrolled. Letters Patent printed, 3d.*]

A.D. 1721, August 12.—No. 434.

DE LA CHAUMETTE, ISAAC.—These Letters Patent include a great number of inventions, among which is one relating to  
 “ coaches and chaises that can neither overturn nor iolt.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1722, May 22.—No. 445.

BADDELEY, RICHARD.—Part of the improvement comprised by these Letters Patent relates to “ an art for making streaks  
 “ for binding cart and waggon wheels.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1722, July 12.—No. 450.

BARLOW, ANTHONY. —This invention relates to “ a new  
 “ addition of a wheele, iron barrs, plates, pinns, &c., to be  
 “ fixed to any sort of coach, waggon, or cart, but more  
 “ especially in the winter season, which, besides severall

“ other advantages of less moment, will effectually preserve the  
 “ road from being cutt and worne out as they now are, and  
 “ render the same commodious and passable in the winter,  
 “ which will tend to the vast ease, safety, and benefitt of  
 “ travellers, by preventing the fatigue and danger of bad  
 “ road and the heavy taxes and expense of turnpikes to make  
 “ them good.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1722, September 23.—No. 451.

DUNNING, RICHARD.—Preventing overturning by “ a new  
 “ machine, called a Poyser which being fixed to any coach  
 “ chariot or chaise will not only prevent their being over-  
 “ turned when most in danger either by the badness and  
 “ vnevenness of the road, the ignorance of the driver or  
 “ unruly horses but also when any wheel should happen to  
 “ break or slipp of the axle tree of any coach chariot or  
 “ chaise (having often experienced the said machine called  
 “ a Poyser) it will be in a great measure a meanes of pre-  
 “ venting the wheels breaking; that the new-invented  
 “ machine called a Poyser would not be above twenty pound  
 “ weight for the largest coach and about twelve pound  
 “ weight for a light chariot or chaise and after the first  
 “ fixing one might be shifted from one coach to another in  
 “ three minutes time and is rather an ornament than a  
 “ disfigure to any coach, chariot, or chaise on which it is  
 “ fixed; it also saves the trouble of dragging the wheels  
 “ down steep hills (as coaches, &c. generall do) and is a  
 “ means of a coach, &c. going more miles in a day than they  
 “ now do without it. It would be equally serviceable to  
 “ waggons, wains, cars, and most other wheele carriages.  
 “ It is humbly presumed that this new-invented machine  
 “ called a Poyser, would be of great vse to vs and the pub-  
 “ lick (as often as occasioned required) in sending and con-  
 “ veying cannon and warlike stores cross the country  
 “ through bad road with more expedition and safety and  
 “ likewise to the nobility, gentry and others who chuse to  
 “ hunt in chariote or chaises which they might do in very  
 “ vneven ground without the least danger.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1724, October 24.—No. 470.

ROGERS, THOMAS.—“A steel worm or rowling spring, to be  
“ vsed in coaches, chariots, or any other carriages.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1728, July 27.—No. 500.

CHAPMAN, WILLIAM.—Two wheeled chaise or chair, which  
is thus described by the inventor:—

“A chaise or chair with two wheels to be drawn with  
“ one horse in or between a pair of shafte, which is so con-  
“ trived as to quarter the roads by the person riding in it  
“ without let or hinderance so as to keep exactly in the coach  
“ track by which meanes the person in such carriage may  
“ travel with more expedition, safety, and pleasure to him-  
“ self and horse than anything of the like nature hitherto  
“ invented; that by meanes of the said invention when the  
“ horse is vpon a full trot or any swifter motion the better,  
“ by only setting a foot vpon a spring and pulling a small  
“ line for that purpose fixed to the carriage, the traveller  
“ may with ease immediately throw off either wheel into the  
“ coach track as he shall find most convenient.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1731, May 20.—No. 529.

THORNHILL, ELIAS. — Improvements in “coal waggon  
“ wheels,” hitherto made of wood only, and consisting in  
“ a new way or method of making the rim or edge of the  
“ said wheels with iron or steel and with iron ribbs or tabbs,  
“ and iron bolts, rivets, and screws for the fastening the  
“ same, which the petiçoner (having made severall experi-  
“ ments thereof at a great charge) knows will more effectually  
“ answer the end for the same use and purpose to all persons  
“ who shall think proper to make use of the said invention  
“ and will preserve the wood of the said wheels and the rails  
“ which they go upon from wearing and will last many  
“ years longer than those now used which are not done  
“ with iron or steel nor rimmed or edged with any sort of  
“ metall to preserve the same and the rails from wearing and  
“ the said waggons by the said invention will carry consider-  
“ ably more coals than usual and the same will be considering



“ the length of time they will last much cheaper and more  
 “ serviceable and for the great use and convenience of all  
 “ gentlemen and others interested and concerned in coal  
 “ mines and the coal trade and will entirely prevent the  
 “ destruction of thousands of timber trees in every year to  
 “ the manifest benefit and advantage of the publick not only  
 “ in the coal trade and preserving the timber trees for ships  
 “ and other vessels, but for the benefit and advantage of the  
 “ nation in generall.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1733, May 11.—No. 540.

LUGG, THOMAS.—Freeing horses from carriages by “drawing  
 “ of a proper string, which will cause the holdfast or bearer  
 “ that will be fixed to the flutchills to let loose the detainer,  
 “ & thereupon a barr of iron turning the chains or harness  
 “ with the swivells and other fastenings will be at liberty.”

[*No Specification enrolled. Letters Patent printed, 4d.*]

A.D. 1734, February 1.—No. 543.

ROWE, JACOB.—Antifriction axles. This invention consists  
 in facilitating easy rotation of the wheel “by the axis of the  
 “ wheels that runns on the ground as usuall, turning round  
 “ on other wheels lying on the topp of the same, and also  
 “ the shoulder of the said axis turns round on wheels instead  
 “ of a dead surface, as usuall.”

[*Printed, 3d. No Drawings.*]

A.D. 1734, October 1.—No. 548.

KING, ROBERT.—“An engine or machine for the scouring of  
 “ the inside of cast-iron boxes for all manner of carriages.”

In this invention a “chock” or chuck is used, in which the  
 box to be scoured is fastened and adjusted by means of screws.  
 The “chock” or chuck is mounted upon a horizontal spindle,  
 capable of revolving in suitable bearings, a screw passing  
 through one of such bearings and serving to keep the spindle  
 in its place. Upon the spindle is fixed a “band wheel” or  
 pulley, from which a band proceeds to a second and larger  
 band wheel, and by the rotation of the latter—which rotation  
 is produced by means of gearing to which motion is given by

an axis turned by a horse—the spindle, chock or chuck, and box carried by the latter are all made to revolve, and the scouring of the box is effected by the application thereto of a stone, which is held in a suitable position by tongs.

[*Printed, 5d. Drawing.*]

A.D. 1740, May 13.—No. 570.

TULL, JOHN.—A certain machine which the patentee calls “a flying sedan chair, fixed upon wheels.”

The body of this vehicle “is in the shape of a sedan chair which will hold two people, with two doors opening before, and glass windows on each side. It is fixed upon a sett of springs, in a fashion entirely new. The whole carriage is below the axletree, which is entirely new. The place for the driver (instead of a coachman’s seat) is a frame fixed on the carriage, twenty-four inches high, which carries a demy peak saddle, upon which the coachman rides astride, which is also entirely a new invention. The place for footmen to ride behind is fixed upon springs, with a box for parcells. It is drawn by a double pole, different from any other, and with either two or four wheels. It hath a new invented lauthorn, fixed before the demy peatt saddle, and a moveable screwed iron axletree, that will fitt any road.” This is “a true and full description” of the invention.

[*Printed, 3d. No Drawings.*]

A.D. 1740, August 9.—No. 572.

CRISPE, WILLIAM.—“A double shaft and pole carriage to cross the rutts and go with two wheels and two horses on abreast together, with proper harness for the same, fitt to carry either a chaise, coach, charriott, caravan, a chaise marine, or any other convenience of that or the like nature.”

“The carriage moves with two wheels fixed either on a wooden or double stapled iron axletree, double shafts of wood are fixed on the carriage so as to move horizontally, within each of which shafts one of the horses is placed, and each of the said shafts is confined by a barr to keep them at a proper distance from each other, and between the

“ horses a pole is fixed on the carriage about four inches above the shafts.”

The harness is also described.

[*Printed, 3d. No Drawings.*]

A.D. 1746, July 26.—No. 618.

HAWKES, THOMAS.—“ A machine to be placed on the axle-trees of wheel carriages, as chairs, chaises, and such like vehicles, &c.; if the carriage or wheels overturn, the bodies of them cannot.”

In this invention, there are fixed upon the axletree of a vehicle certain curved plates or pieces of metal, so arranged as to form a grooved bed, and provided with friction wheels there being connected to the lower part of the body of the vehicle other plates or pieces which form an inverted arch, this resting upon the friction wheels mentioned above, and being capable of working freely thereon; the result of the whole arrangement being that although the axle may diverge from the horizontal position; the inverted arch connected to the body of the vehicle, working to and fro upon the friction wheels, will preserve such body in a perpendicular position.

The details of the invention are minutely set forth, and include the use of a large number of plates, shafts, bolts, jacks, and other adjuncts, the method of fastening the parts together and applying them to a vehicle being described at some length. These details, however, are all of a minor character, and may be varied.

[*Printed, 7d. Drawing.*]

A.D. 1750, April 6.—No. 655.

THOMPSON, JOHN.—“ A chain or carriage for one person to travel in with one wheel and harness for the horse.”

This vehicle somewhat resembles a wheel-barrow in general characteristics. It is furnished with shafts in lieu of handles and is supported by the horse to the back of which it is attached by suitable harness, so contrived as to allow the carriage to adjust itself to the horse. There is but one wheel which follows in the track of the horse. A platform may be fitted behind the driver's seat and over the wheel, for the accommodation of another passenger.

[*Printed, 6d. Drawing.*]

A.D. 1754, January 22.—No. 687.

BUTLER, SAMUEL, and WRIGHT, JOHN.—“Improvements  
“ of coaches and other wheel carriages, so as to render them  
“ more easy, safe, and convenient to those that are conveyed  
“ in them, and less burdensome to the horses that draw  
“ them.” Also “a spring of a peculiar kind, which will be  
“ abundantly lighter and less liable to disorder than any  
“ other for the above purposes hitherto used, and which  
“ spring is formed by two braces, united at the ends and  
“ divided in the middle by a steel worm in two triangles,”  
such spring “rendering coaches and other wheel carriages  
“ more safe, easy, less liable to disorder, and consequently  
“ cheaper to His Majesty’s subjects.”

The specification of this invention is as follows:—“A  
“ spring to be applied to coaches, and all kind of wheel  
“ carriages, formed by two braces united at the ends, and  
“ divided in the middle by a steel worm or circle into two  
“ triangles.”

[*Printed, 3d. No Drawings.*]

A.D. 1757, April 9.—No. 714.

LADD, JOHN.—This invention relates to “An entirely new  
“ method of making and constructing, on mechanical prin-  
“ ciples, waggons, wains, carts, and other wheel carriages,  
“ and rollers for roads, tilled lands, walks, and gardens,  
“ which, without any horses or other cattle, and with a very  
“ moderate and almost inconsiderable human force, will move  
“ rollers of any size,” “and will move and carry from place  
“ to place great weights in such waggons, wains, carts, or  
“ other wheel carriages” in any places where there are not  
very steep ascents, or on hilly ground with a much fewer  
number of horses or other cattle than usual; the invention  
being also applicable to coaches and other carriages.

This invention consists in the first place in a mode of propelling vehicles by means of winches and certain toothed wheels and chains. An arrangement is described in which a winch is placed upon a shaft mounted in the front part of the vehicle, there being also upon this shaft a pinion having around its circumference teeth or “leaves,” a chain passing partly around this pinion, the links of which fit upon the

teeth and also partly around a wheel which is much larger than the pinion and provided with similar teeth, this wheel being upon a shaft on which is also a second pinion, and a second chain passing from this to a wheel fixed upon the axis of the vehicle, the result of the arrangement being that by turning the winch the vehicle is put in motion by the exercise of comparatively small power. These arrangements may be varied according to circumstances, and if desirable anti-friction rollers may be placed between the body of the vehicle and the axle, which will enable it to be moved with the exertion of still less force. Different modes of applying such rollers are set forth, the main feature of this part of the invention, however, consisting in the employment of a box which may be bolted to the side of the carriage or its frame, such box containing two anti-friction rollers which bear upon the axle. An axle is also described as having collars thereon between which rollers are mounted in a horizontal position, the object of these rollers being to reduce the pressure upon the shoulders of the axle when the vehicle is passing over uneven ground. An axle is also described as being square at one end and round at the other, the patentee stating that this will enable a heavily laden vehicle to turn with greater facility than usual. A carriage wheel is also described which is apparently meant to work upon a short independent axle, such wheel having the spokes strengthened by means of a ring placed at some distance from the centre of the wheel. A "slider or slipper" is also set forth as consisting of a circle or wheel on a part of the circumference of which are teeth, these being in gear with those upon a smaller circle or wheel of similar form; this apparatus being apparently meant to be placed in connection with the front axle of a carriage, and the smaller wheel be operated upon by a winch or "leaves" for the purpose of turning the carriage. A mode of applying the invention to a machine for raising heavy weights is also set forth, and the invention is mentioned as being applicable to various other purposes.

[*Printed, 9d. Drawing.*]

A.D. 1757, November 11.—No. 717.

HARRISON, WILLIAM. — "Certain engines called coach  
" springs, whereby coaches, chariots, berlins, chaises, ma-

“chines, and carriages of all kinds may be hung with the  
 “utmost safety, ease, and pleasure to the persons who ride  
 “in them.”

This invention consists essentially in the employment of  
 “hoop springs” combined with certain framing, the hoop  
 springs being each composed of a plate or thin bar, bent into  
 a nearly circular form, and having the ends coiled backwards  
 so as to form receptacles or eyes for the bolts by which the  
 spring is connected to the framing. One arrangement is  
 described in which two hoop springs are connected to each  
 side of certain framework by means of pins, the action of the  
 springs being controlled by a certain bolt and a “check  
 “spring.” In this arrangement the springs are apparently  
 meant to expand when acted upon, the bolt already mentioned  
 preventing them from expanding too far, but another ar-  
 rangement is set forth in which the hoop springs are expanded  
 when at rest and are closed by compression.

The patentee states that the number of hoop springs em-  
 ployed may be increased “by placing them one within the  
 “other, or by the side of each other, or at right angles,  
 “according to the weight of the carriage,” and that they  
 may “be made to turn each upon a separate pin, or several  
 “upon the same pin.”

[*Printed, 9d. Drawing.*]

A.D. 1758, December 21.—No. 732.

POOLE, JAMES, and RINGSTED, WILLIAM. — Covering  
 carriages with metal in place of leather. The nature of the  
 invention is thus described by the patentees:—“To prepare  
 “and make the outside pannels and tops of coaches, chariots,  
 “post chaises, sedan chairs, and other such like carriages,  
 “and properly fix a board underneath to support the copper,  
 “iron, or brass plates, and afterwards such plates are fixed  
 “on the outside of such carriages, and fastened down with  
 “mouldings of wood or brass that cover the edges of the  
 “plates; and the plates for covering such carriages on the  
 “outside with copper, iron, or brass, beautifully japaned or  
 “enamelled with gold, or without, instead of leather, are  
 “made and performed by rolling the copper, iron, or brass,  
 “in a mill very thin, and afterwards planisht very smooth  
 “with hammers, and cutt to fit the carriages they are made

“ for, and afterwards tooth'd all over to hold the japan,  
 “ which being done over several times, and baked in hot  
 “ stoves made for that purpose, untill they are hard enough  
 “ to bear a high pollish, and such plates are to be ornamented  
 “ with gold borders, coats of arms, or any other embellish-  
 “ ment, are then painted or japaned to any pattern, which  
 “ is also varnished, and afterwards baked again in stoves untill  
 “ very hard, which preserves them long.”

[*Printed, 3d. No Drawings.*]

A.D. 1759, February 10.—No. 737.

BEDFORD, STEPHEN.—“ A method of impressing in imitation  
 “ of engraving upon varnish laid upon copper, iron, paper,  
 “ and other bodys, to be used in coach pannels, snuff boxes,  
 “ and other kinds of merchandise, and impressions of foliages,  
 “ figures, decorations, ornaments, and other devices.”

This invention is thus set forth:—“ Ingrave any sort of  
 “ works, figures, or decorations upon copper or any other  
 “ metal plates, and take off the impression with very thin  
 “ rolled lead, and with such impression raised therein you  
 “ may impress the same work upon a body of varnish laid  
 “ upon copper, iron, paper, or other bodys.”

[*Printed, 3d. No Drawings.*]

A.D. 1759, February 21.—No. 738.

TREDWELL, RICHARD.—“ New-invented ribbed springs for  
 “ hanging of coaches and all other carriages upon, which  
 “ said ribbed springs are so adapted as to be abundantly  
 “ lighter, much easier for the ryder, and less liable to break,  
 “ than any that has hitherto been made.”

The patentee thus specifies this invention:—“ Take a thin  
 “ plate and stamp the same in a ribbed mould, either round  
 “ or square, until such plate is become ribbed in one or  
 “ more ribbs, and each plate being ribbed so as the rib or  
 “ ribs of such plate run one within another, whereby they  
 “ carry a much greater weight than other springs do, and  
 “ which enables me, the said Richard Tredwell, to make  
 “ them more than one third lighter than have been usual.”

[*Printed, 4d. No Drawings.*]

A.D. 1759, July 14.—No. 740.

BLOCKLEY, THOMAS.—Making tires. Part of this invention relates to the manufacture of wheel tires, and the process is thus described:—"Let a bar of iron, of the length intended, be heated in a furnace. When hot let the same be put into a press or stamp with which the holes may be pierced. When this is done let the barr be taken to an anvell made hollow, in the nature of a mould, to the form and size the tire is intended, and let the same be wrought by a hammer fixed in an engine of the exact dimensions of the sloop or hollow of the anvell, by which the tire may be com-pleated."

[*Printed, 3d. No Drawings.*]

A.D. 1759, November 29.—No. 743.

PEASE, THOMAS, and MONK, WILLIAM.—This invention is set forth as consisting in an "entirely new and particular kind of axeltrees," for which the patentees claim various advantages, among which are mentioned working with less friction than usual, the "axeltrees" moreover being "so framed and contrived as to preserve the wheels from taking fire."

The apparatus consists in the first place of a long wooden bed, into each end of which is let a metallic box for the reception of an axletree, there being one of the latter to each wheel, and the wheels and axles being thus capable of revolving independently of each other. The outer ends of the axles are firmly screwed into the naves of the wheels, and in order to retain the axles in their places in the wooden bed each axle is grooved at a short distance from its inner end, bolts being passed through the bed which partially enter the grooves, and each bolt being furnished with a cavity or reservoir for the reception of oil, which is introduced thereto through an opening provided for the purpose, and the axles thus maintained in a proper state of lubrication. A cap is screwed upon the outside of the nave of each wheel, this preventing the access of sand, dust, &c., to the working parts of the apparatus.

[*Printed, 5d. Drawing.*]



A.D. 1762, February 10.—No. 768.

TREDWELL, RICHARD. — “ Curious new iron machine for  
“ moulding and setting all kinds of springs for hanging of  
“ coaches and other carriages upon, which is so contrived as  
“ to perform the work much better and with far less time  
“ and labour than the present method performed by hands.”

This invention is described by means of a drawing or  
“ plan,” from which it appears that the “ machine ” men-  
tioned above consists essentially of a bent bar or lever, mounted  
upon a fulcrum at one end, and provided with clamps by  
means of which the piece of metal meant to form the spring  
may be bent into a shape corresponding with that of the bar  
or lever, such piece of metal being laid upon the bar, and the  
clamps operated by being “ either screwed or keyed.” The  
bent bar or lever may be varied in form, according to the  
particular form of spring desired.

[*Printed, 5d. Drawing.*]

A.D. 1762, February 10.—No. 769.

TREDWELL, RICHARD, and OVERTON, THOMAS.— “ New-  
“ invented springs for hanging coaches and other carriages  
“ upon,” such springs being “ so constructed as not to be  
“ liable to give way or break, much steadier, and in many  
“ other respects far more servisable and preferable than any  
“ other that has been made.”

The invention is thus set forth:—“ Take thin plates, and  
“ either flute the plates at the points, or throughout the  
“ length thereof, or in the middle, which said plates are  
“ made in various directions or turnings, according as the  
“ purchasers desire; and in joining the said plates together  
“ to make the said spring compleat the back of the first plate  
“ is adapted to go in and suit the second plate, either by  
“ fluting the same as aforesaid, or by a slit, notch, or groove,  
“ made at the points or middle of the plates to receive the  
“ flute and hold the same together; and the back of the third  
“ plate is made and adapted in like manner to the second,  
“ and so on untill the whole number of plates are joined and  
“ set which are necessary to compleat the said spring; and  
“ in making the same the back plate may be made flat, while  
“ the other or others are fluted, whereby the said springs

“ become strong and much more useful and convenient than those heretofore made.”

[*Printed, 3d. No Drawings.*]

A.D. 1763, July 29.—No. 792.

TREDWELL, RICHARD.—“ New method of making and constructing springs for hanging of coaches and all other kinds of carriages upon, which is so contrived as to be much lighter and genteeler, and far easier and safer for the rider, than any yet made, without being liable to break or sett, as those commonly used frequently did.”

This invention, as set forth by the aid of a drawing annexed to the Specification, apparently consists of certain curved plates, jointed or otherwise connected together, and having their outer ends united through the medium of what the patentee calls a worm or plate, this being, however, obviously a spiral spring, which, it would appear, is meant to be compressed by the weight of the carriage. The patentee states that “ the plate or plates, worm or worms, may be set in various forms and shapes; or the same may be done by a cranke plate with a pin through to the middle, or in divers other forms and shapes, as shall be thought fit to answer the purpose aforesaid.”

[*Printed, 6d. Drawing.*]

A.D. 1763, December 2.—No. 801.

O'KEEFFE, OWEN.—“ New-invented axletree, and box for the same to run in, to be used for coaches, chariots, and all other kind of carriages, which is so contrived as constantly to supply itself with oil without having occasion to take off the wheels to grease, as is comonly done, and no water or dirt is lyable to get into the stock or nave of the wheel, even when it is under water, whereby the carriage will run much smoother, be neater and cleaner, and not lyable to fire as those now used are, and a great of money and time will be saved by not taking off the wheels to grease, as well as many other advantages in travelling.”

The patentee thus describes the mode of carrying out this invention :—“ Make an inside shoulder to the box behind and a rais'd shoulder on the axletree to fill the inside shoulder

“ of the box, and a hoop or cap and plate fixed on the axletree  
 “ to cover the hind end of the box to keep the dirt or water  
 “ out, and a groove or channel made in the top of the axletree  
 “ for the oil to drop in from a cannister or vessell or vessells  
 “ fixed in the axletree beds, or to the shafts or sides of the  
 “ carriage or elsewhere, as is proper to convey the oil to the  
 “ box. At the linspin end of the box or boxes there is an  
 “ inside shoulder which stops the oil from running out, and  
 “ an outside shoulder for the nut or sockett for the wheel  
 “ iron or inside shoulder or stop to stop the oil without an  
 “ outside shoulder.”

[*Printed, 3d. No Drawings.*]

A.D. 1764, April 16.—No. 811.

O'KEEFFE, OWEN.—“ New-invented carriage for hanging  
 “ coaches, chariots, chaises, and all kinds of bodys upon,  
 “ which is constructed on a new principle, and is much easier  
 “ to the rider and lighter for the horses, and in many other  
 “ respects far superior to those now used.”

The patentee mentions in the first place a four wheeled carriage, in which the perch and top carriage are so arranged as to move upon a centre of wood or metal “ to fasten to the  
 “ upper carriage or perch at each end, the hind center to be  
 “ laid in, on, or under the center of the hind axletree or axle-  
 “ tree bed and hind transom, with a cavity or hole boxed with  
 “ iron, or any other kind of mettle, or without, for the center  
 “ to move therein, springs boulded on the hind transom and  
 “ framework of the axletree bed, and lays over the transom  
 “ that is made fast to the perch to ease the jolts of the hind  
 “ wheels.”

“ The fore part of a four-wheel carriage ” is also described as being composed of “ a new framework of wood and iron  
 “ made in diferent shapes as may be thought fitt, to lay on  
 “ the under carriage for the center piece for the perch to lay  
 “ on, and fastened as may be thought fitt to give the centre  
 “ liberty to work and lett the four wheels have their full  
 “ liberty to lock under against the perch, and the wheels to  
 “ rise and fall without a side jolt to the body hanging  
 “ thereon; the center piece to be made fast to the framework  
 “ that acts or moves on the under carriage as above, and be  
 “ made of wood, iron, or any other mettle thought fitt, and to

“ move on, in, or under a framework made fast to the perch  
 “ or perches or shafts at the fore end of the upper carriage.”

“The hind end of a four-wheel carriage” is set forth as consisting of a “center piece” made of wood or metal, and  
 “ to be made fast to the axletree or axletree bed and transom,  
 “ to move in, on, or under the framework made fast to the  
 “ perch or perches or shafts;” and “a two-wheel carriage” is mentioned which is to contain a “center piece made as  
 “ before, and made fast to the framework belonging to the  
 “ shafts,” and which moves in, on, or under the axletree or  
 “ axletree bed and transom; or is made fast thereto and  
 “ moves in the framework belonging to the shafts,” which framework is made as before “described, and springs bolted  
 “ and lays over the said framework, as before mentioned.”

[*Printed, 3d. No Drawings.*]

A.D. 1764, May 25.—No. 813.

FOSTER, JOHN.—“New-invented method of making inside  
 “ seats to coaches, chariots, and all other kind of carriages,  
 “ with braces and springs, whereby the same are abundantly  
 “ easier to the rider than any other heretofore made.”

All that the patentee says is:—“Braces and springs, made  
 “ of leather, girtwebb, or any other materials that may be  
 “ thought fit; the braces are strained from pillar to pillar,  
 “ through rings fixed for that purpose to the back rail of the  
 “ body or elsewhere; a light spring fixed under the braces in  
 “ the center of the fore part of the seat.”

[*Printed, 3d. No Drawings.*]

A.D. 1766, January 28.—No. 838.

HILLCOAT, THOMAS.—“A machine for disengaging horses  
 “ from coaches, chaises, and such like carriages, on any  
 “ emergency, by which persons riding in any of those car-  
 “ riages might in an instant, with the utmost ease, set the  
 “ horses loose from the carriage when going at any pace or  
 “ on any ground whatever, whereby various misfortunes that  
 “ might otherwise happen to His Majesty’s subjects by horses  
 “ running away with carriages might be effectually pre-  
 “ vented.”

In this invention four pins are in the first place secured to

the "splenter barr" of the carriage, the traces being fastened to these pins, and the latter being firmly secured to the "splenter barr" by means of certain "irons" and bolts, the latter, however, being connected to an upper bar which is capable of being raised by means of a lever and certain apparatus connected therewith, the raising of such bar withdrawing the pins from the traces, and so setting the latter, and consequently the horses, at liberty from the "splenter barr." And in order to facilitate this operation a hollow bar of iron is attached to the front end of the pole of the carriage, a ball of wood, having springs connected thereto, and which springs are inserted into the hollow bar, being connected with a sliding socket carrying buckles to which the "breast leathers" are attached, the result being that when the horses are disengaged from the "splenter barr," as mentioned above, the socket slides off from the hollow bar "and entirely disengages the horses from the carriage."

[*Printed, 5d. Drawing.*]

A.D. 1766, August 5.—No. 855.

PEASE, THOMAS.—"A machine and spring for rendering coaches, chariots, chaises, or any other vehicle to hang more steady, safe, and easy, than any hitherto invented, by means of which machine every spring had its equal bearing."

In this invention a spring, which is apparently formed of several plates laid one upon another and slightly curved, is connected at one end to a "stay iron," the latter being also connected to a shackle from which the body of the carriage is suspended. The other end of the spring is also united to the shackle, but through the medium of certain curved bars which the patentee denominates the "machines," these being shown under various modifications. "Wooden beds to fix the springs upon," and certain plates, standards, and axes, are set forth as forming parts of the details of the invention, which details, however, will not be clearly understood without the aid of the drawing annexed to the Specification.

[*Printed, 5d. Drawing.*]

A.D. 1766, November 8.—No. 861.

TREDWELL, RICHARD.—“Method of making springs for the  
“ ease and convenience of coaches and other carriages, with  
“ a worm and pin, and either with or without a plate, fixed  
“ in several forms and shapes, to answer many usefull pur-  
“ poses.”

This invention is carried out “by means of the plate or  
“ plates and worm springs, with solid pins to go through the  
“ center of the worm as a director to keep the worm springs  
“ upright or in a direct line or even, and short pins with  
“ shoulders to press the worms, which are contained in any  
“ sort of pipes or tubes of mettle, or covering, or otherwise  
“ or without covering the same, as shall be thought fit; and  
“ also a split pin and sliding bolt to go within the same, with  
“ worm springs fixed thereon for a director, to keep them in  
“ a direct line, the sliding pins and bolt being so contrived  
“ and fastened with screws, rivetts, and stops, that when the  
“ weight is fixed at each end with proper loopes or shackles  
“ of iron it presses the worm closer together at each end, so  
“ as to give it an elastick motion. These may be made to  
“ any length, and to carry any weight. They may be fixed  
“ to the points of any common sorts of springs, or to the body  
“ and carriage, and with or without a short brace, or the  
“ assistance of any other spring whatsoever. They will also  
“ supply the place of braces where they are made use of, if  
“ required, and to be covered with tubes, or not covered, and  
“ made to such forms, sizes, and fashions, and of such  
“ materials, as shall be thought fit.”

[*Printed, 3d. No Drawings.*]

A.D. 1766, November 21.—No. 863.

HATCHETT, JOHN.—“A new spring for the hanging the  
“ bodies of coaches and other carriages upon, both for town  
“ and country.”

The main feature of this invention, which is described by means of a drawing containing numerous figures, consists in the combination of a “scrowl” or spiral spring with a “main  
“ spring,” the latter being of slightly curved form in some cases, while in other cases it also partakes of the spiral character.

“The scrowl or serpentine spring is fixed to the main spring by a joynt, bolt, pevitt, pin, or otherwise at pleasure, or turned out of the main spring in one plate or plates used or applied to the top of the said main spring or to the bottom or intermediate parts of the said main spring, to draw up or force down or pull out by the main spring. If used with stays or leavers then the said stays or leavers are to be cased in wood or in brass, or in any other metal or metals, ornamented rich or marked plain.”

The invention is shown in the drawing under a great variety of modifications, the details of which will only be clearly understood with the aid of such drawing. In one case a “scrowl” is set forth a pressing down a small “ess” spring. In another case one “scrowl” presses down a second “scrowl;” and in another case a main spring has attached to it a brace by which it is connected to a “scrowl” spring, the brace itself containing a small “scrowl.” This arrangement is mentioned as being applicable “for Italian or other chaises.”

[*Printed, 6d. Drawing.*]

A.D. 1767, November 2.—No. 883.

STOKOE, THOMAS.—Carriage for minerals. This invention which includes a carriage for the hauling of minerals is thus stated:—“A Scotch or whim gin, to be turned upside down and supported with wood, on which the oxen, horses, mares, or geldings, & riders or drivers thereof, to be used, are to be placed, and to draw a weight, thirty or forty stones or thereabouts, upon a four wheel carriage, with rowlers or cylinders, vertical or horizontal wheels, also a cap of iron upon the overtree bolt & wheels, to be fixed to the overtree & crosstree, if occasion requires them; the rope to be used therewith in drawing coals, stones, earth, rubbish, & water from coal pitts, or other pitts & shafts, must be an endless rope, and to pass round a small roller, to be fixed at or near the bottom of such pitts or shafts, the better, if necessary, to guide such rope; & when the machine is to be made use of to remove any heavy weight or burthen to any distance, with or without a coal waggon way, then the cylinders or rollers, vertical or horizontal wheels, must be affixed to the carriage with irons, ropes, or wood, whereby as well the

“ weight as the strength of the oxen, horses, mares, or geldings used in drawing the same are got.”

[*Printed, 3d. No Drawings.*]

A.D. 1768, January 2.—No. 891.

LAYCOCK, THOMAS. — Window blind for carriages. The invention is described by the patentee as divided into two parts, viz. :—“ Imprimis, the shade blind to slide down the groove, and to answer at once the purposes of shutter and curtain.”

“ Secondly, the shades, made of wood or metal, to form a close pannell in the frame. When down, each lath of the blind to turn on a pin or centre, by which it is fixed in the frame. The pin or centre may be fixed on the top or bottom edge, or near the top or bottom edge, or in the middle of the lath. The pin or centre may be fixed to the frame, hole, or socket, to the end of the lath. The shade blind to be guided by ribbon, line, or tape, connected to the shade; the guide may be made of wood or metal. At one end or side a spring bolt or latch constructed, to keep the blind close or in different degrees of elevation. At one end or side may be a spring bolt or latch, to keep the shades close down as a pannell. At one end or side may be another spring latch, with a tooth rack or jack, constructed to keep the shades in different degrees of elevation. The shades may be kept down as a pannell by a button, and fixed to different degrees of elevation by a hook.”

[*Printed, 3d. No Drawings.*]

A.D. 1769, January 19.—No. 914.

JAMES, WILLIAM, and MASON, NATHANIEL. — “ Great improvements in the wheel carriages of the coach kind, to wit, coach, charriot, landaw, chaise, or by whatsoever other denomination such carriages may be termed, called, or known.”

The mode of carrying out this invention is thus described :—  
“ A crane neck with an iron bar fixt horizontally against the end of the perch, of a discretionary length and circular form, with a streight iron bar fixt at one end by a swivel to the transum wheel or to some other part of the carriage or crane that has communication with the transum wheel, and



“ the other end made with a loop or noose to slide upon the  
 “ first-mentioned bar, which gives way to the right and left  
 “ to let the fore wheels lock to such an angle as thought  
 “ proper, without touching or going quite under the cranes ;  
 “ which streight bar not only serves for the locking of the  
 “ wheels as above, but also for strengthening the cranes, by  
 “ preventing their giving way either backwards or forwards ;  
 “ and also to have the use and benefit of a high fore wheel of  
 “ any height, from four feet diameter to five feet six inches  
 “ and upwards, at discretion, for coaches, charriots, or chaises,  
 “ there never having been in use a fore wheel exceeding the  
 “ diameter of four feet three inches ; and also to have the  
 “ use and benefit of a new-constructed box to be placed in the  
 “ naves of the wheels for the axletrees to run in, of the nature  
 “ and description following :—The length or depth of the box  
 “ in the inside, whereon the axletrees bear, of about two  
 “ inches and a quarter, and a groove in the middle of such  
 “ box of three quarters of an inch, or one third part of the  
 “ whole, cut or sunk from the level thereof, of about a quarter  
 “ of an inch deep, to hold the grease, thereby preventing the  
 “ axletrees running dry.”

[*Printed, 3d. No Drawings.*]

A.D. 1769, March 7.—No. 920.

PICKERING, JOHN.—Chasing coach furniture, &c. “ The  
 “ various kinds of work are performed by different machines,  
 “ each respectively adapted to the dimensions of the piece in  
 “ hand, but being of the same kind and consisting of an  
 “ oblong square frame with two rods, in which an iron moving  
 “ forcer, or weight, or hammer, faced with a softer metal the  
 “ better to assist the impression, is worked by the assistance  
 “ of three wheels upon a striking block, with a die fixed  
 “ thereon formed for each respective purpose.”

[*Printed, 3d. No Drawings.*]

A.D. 1769, March 14.—No. 921.

MOORE, FRANCIS.—“ Machines or engines, made of wood,  
 “ iron, brass, copper, or other metal, to be wrought or put in  
 “ motion by fire, water, or air, with a small assistance of  
 “ horses or manual labour, which will be very useful in agri-

“ culture, carriage of persons, goods, and navigation, by  
“ causing ships, boats, barges, and other vessels to proceed  
“ with more swiftness.”

[*No Specification enrolled. Title printed.*]

A.D. 1769, June 8.—No. 927.

REEVES, CHRISTOPHER.—“ Certain springs whereby coaches  
“ and all other four-wheel carriages would go and travel with  
“ much greater ease as well in town as in the country, than  
“ with any other spring or springs which had hitherto been  
“ invented or discovered, together with the method of sup-  
“ porting the bodies of such carriages upon the said springs  
“ in the center in such manner as would greatly conduce to  
“ prevent the overturning the same by almost any accident  
“ whatsoever.”

As regards the springs mentioned above, “first are two  
“ sockett nutts, with two check plates at one end of each  
“ sockett nutt, which meet together in the middle and have  
“ four bolt holes to receive the ends of the springs; the spring  
“ plates are turned in a circle, meeting in the middle, the  
“ ends turned with a thimble eye to receive a bolt which  
“ fixes them to the check plates of the sockett nutts. The  
“ sockett nutt of each end receives a long screw with a  
“ thimble head to fix the shackle with a screw bolt which the  
“ body hangs by; the long screws are screwed reverse, one  
“ screwed to the right hand and the other to the left, which,  
“ by turning the middle of the spring one way contracts it,  
“ and the other way makes it longer, which is a conveniency  
“ to hang the body a proper height. To the inside of the  
“ check plates, where the springs are fixed to, on each side,  
“ is a sliding catch bolt for security if the spring should  
“ break, to prevent the body from falling or sinking down  
“ low: the sockett nutts and screws are covered with brass  
“ barrels, soldered on at each end, which slide over each  
“ other as the spring contracts or lengthens and conceals the  
“ work.”

As regards supporting the bodies of carriages upon the  
springs the first part of the apparatus consists of “a flatt  
“ plate stay, put in with screws to the inside of the elbow  
“ rails and flaps against the standing pillars, and likewise  
“ against the middle of the corner pillars. The second is a

“ flatt stay from the splice of the bottom side to the middle of the standing pillars, fixed with bolts. The third is a principal and main stay, which is fixed from the bottom side and standing pillars at the bottom with screw bolts, and directs itself to the middle of the corner pillars, where it receives the iron work by a screw nutt which receives a strong screwed ring with a broad collar from the outside of the pillar which the body hangs by. To the ring is fixed a swivel loop or shackle, which fastens to the spring with a bolt, as a further security ;” the side pannells are each of them lined with additional inside pannells, “ fitted in curiously between the framework, to be rabitted and screwed up to the elbow rails, and further secured by the back seat rails and a ledge down the standing pillars ; the elbow rails are broad, with double tenons.”

[*Printed, 3d. No Drawings.*]

A.D. 1769, July 13.—No. 932.

JACOB, JOSEPH, the younger.—“ A method for the better construction of wheel carriages, by the application of united spiral springs, hoop wheels, and leather boxes.”

As regards springs this invention consists of two springs which are each of spiral form at the upper part, the lower ends being apparently meant to be attached to some part of the carriage framing, while the upper and curved ends are provided with forked sockets by which they are connected to a horizontal bar, mounted and capable of turning in suitable bearings. Such upper ends are also furnished with shackles for the reception of braces by means of which the body of the vehicle is suspended from them and the result of the arrangement is that on the weight of the carriage coming upon the springs they have uniform action owing to their being connected by the bar.

The “ hoop wheels” differ from those ordinarily used in the construction of “ the felleys or periphery, which, instead of being sawed out of timber to the shape required are made of strait-grained wood, of any width, in one, two, or more pieces, and bent by art like a hoop to the necessary form.”

“ The leather box is made, either long or short, of a piece of strong leather closed and sewed together, along the

“ outside of which is either one or two esses or ridges for  
 “ fastening the box into the nave of the wheel.”

[*Printed, 5d. Drawing.*]

A.D. 1769, July 13.—No. 933.

MOORE, FRANCIS.—“ Machines or engines, made partly of  
 “ wood and partly of iron, brass, copper, or other metal, and  
 “ constructed upon peculiar principles, capable of being  
 “ wrought or put in motion by force or power, without being  
 “ drawn by horses or any other beasts or cattle, and will be  
 “ very useful in agriculture, carriage of persons and goods,  
 “ and also in navigation, by causing ships, boats, barges,  
 “ and other vessels to move, sail, or proceed with more swift-  
 “ ness or dispatch than usual.”

[*No Specification enrolled.*]

A.D. 1770, January 26.—No. 952.

WILDEY, HENRY.—“ An axletree of a new construction, with  
 “ a washer box and collars to be fixed on the arms of the  
 “ axletree, and by truck wheels inclosed in the said box, to  
 “ be applicable to the common axletrees now in use, but not  
 “ upon centers, by which invention the grease or oyl will  
 “ continue for many months without any fresh supply of  
 “ grease or oyl.”

No usual detailed description of this invention is given in the specification, the latter being accompanied by a drawing containing various figures, and a short paragraph with each figure to state what is represented by it.

The “ arm ” of the axletree is stated to be of “ oval or any  
 “ irregular form, the intent of which is to prevent the work  
 “ from going round,” and a “ box,” having an oval opening  
 therein, and furnished with holes for bolts, being apparently  
 meant to keep the axle in its place. Another box is shown in  
 which the opening is circular, this box being furnished inside  
 with trucks or rollers which appear to be intended to work  
 upon the axle and so act as anti-friction rollers ; and washers  
 are also mentioned as being employed to prevent the waste of  
 oil from the box, and also the access of dirt thereto ; a “ pipe  
 “ box that preserves the oil from the nave,” and a long cast

box and certain screws or rivets for keeping the collars “ or in “ works ” in their places being also set forth.

[*Printed, 9d. Drawing.*]

A.D. 1771, September 17.—No. 997.

JACOB, JOSEPH, the younger.—“ A method for the better “ construction of wheel carriages.”

According to this invention there is attached to the middle of the fore axletree or axletree bed of a coach, waggon, or other vehicle “ a piece of iron or wood, through which, at “ any discretionary distance from the axletree, is passed the “ perch bolt which forms the point or center on which the “ carriage locks or turns; the fore end of the perch is pro- “ tracted before the transom far enough to maintain is bear- “ ing on the axletree bed when the under carriage is locked “ round to its utmost extent. The fore part of the head of a “ landawlet is constructed with a joint or hinge at the top of “ each standing pillar, another joint or hinge at the top of “ each fore pillar, and a joint or hinge to the roof on each “ side between the fore pillars and standing pillars, by means “ of which the upper part of the fore pillars and the fore part “ of the roof fold up and fall back with the hind part of the “ head. The body of pleasure carriages is hung by placing “ the center of gravity below the points of suspension, which “ is effected by means of iron rods let through the bottom “ withinside the pannels at the corners of the body, and “ placed perpendicularly under sockets or plates fixt to the “ body at discretion, to receive the rods; the step to the body “ is made with joints to fold up under the bottom, and by “ means of a quadrant stay let through the bottom, the step “ is put up and down at pleasure. The boxes of the wheels “ to receive the axletrees are made in a spiral form of iron, “ steel, or any other substance. The motion of the carriage “ is occasionally retarded by increase of friction effected by “ means of levers fastened to the axletree or bed of one end, “ and acting on the knaves of the wheels at the other. The “ coachman’s seat, cover, or hammock cloth is made either of “ carpet, or of canvas or cloth of any colour or colours, and of “ any pattern or patterns.”

[*Printed, 3d. No Drawings.*]

A.D. 1772, November 13.—No. 1026.

BUTLER, JAMES.—“ Spring wheels for carriages.”

According to this invention the nave or middle of the wheel “is made of wood and bushed as a common wheel;” the rim or outside circle being composed of “wood fellies, “straitly fixed in a circular iron hoop,” there being in the latter certain “counter struck holes” for the reception of the “feet of springs which serve the purpose of spokes. These springs are made of steel, and bent into a form somewhat resembling that of the letter S, and “being made with square “feet with two holes in each, are strongly screwed into the “nave. The feet of the other ends are made lengthways, and “with two holes which receive the ends of the bolts that “come through the iron hoop and confines the hoop, the “fellies, and springs all at one time, and by the foot of every “other spring being fixed across the joints of the fellies, prevents the joints from stirring out of place.”

[*Printed, 5d. Drawing.*]

A.D. 1772, November 20.—No. 1027.

CLAY, HENRY.—“ Making, in paper, high varnished pannels “or roofs for coaches, and all sorts of wheel carriages and “sedan chairs, pannels for rooms, doors and cabbins of ships, “cabinets, book cases, screens, chimney pieces, tables, tea-trays, and waiters.”

This invention is carried into effect “by pasting several “papers upon boards or plates of regular thicknesses on each “side the same, to prevent one side counteracting or drawing “with superior force to the other in the state of drying; and “when the same is rendered sufficiently strong for the purpose intended it is then planed or cut off at the edges until “the board or plate appears, and then taken off such boards “or plates. The pieces of paper are afterwards screwed or “fastened on boards or plates, and put in a stove sufficiently “hot to deprive them of their flexibility, and at the same “time are rubbed over or dipped in oil or varnish, which so “immediately drenches into them as to secure them from “damps, &c. After the papers are thus made they are “capable of being sawed into different forms, and planed as “wood; and if joining the parts be required, as in tea trays,

“ dressing boxes, and some other articles, they are done by dufttailing or mitering, in the same manner as if made in wood. After the various articles are thus formed in the paper they are then coated with colour and oils sufficient to make the surface even, and are then japanned and high varnished.”

[*Printed, 3d. No Drawings.*]

A.D. 1774, February 14.—No. 1065.

JACOB, JOSEPH, the younger.—“ A method of ornamenting carriages, sedan chairs, buildings, furniture, musical instruments, books, and toys.”

This invention consists in “ painting, gilding, japanning, lacquering, high varnishing, engine cutting, stamping, printing, engraving, inlaying, and piercing the metals commonly called tin foil, lead, and pewter, beat or roll’d out into thin sheets, and fixed on to the parts of the afore-said subjects designed to be ornamented; ” also in a mode of constructing coach boxes, and a method of hanging the hind footboards of carriages.

A coach box, or boot, is described, which contains in front a complete coachman’s seat and footboard, a certain “ jointed stay ” serving either to fix the footboard up or fold it within the boot as required. A footboard is also described as being jointed to the carriage at one end, and supported at the other end by being suspended from a brace which is connected to the spring of the carriage.

[*Printed, 3d. Woodcuts.*]

A.D. 1774, September 12.—No. 1082.

NELME (otherwise CYNELME), LEMUEL DOLE.—An alarm, “ whereby sedan chairs, coaches, chariots, post chaises, and other carriages may be immediately stopped, and their attendants summoned in cases of imminent danger.”

[*No Specification enrolled.*]

A.D. 1774, November 10.—No. 1085.

HATCHETT, JOHN. — “ New-invented art or mystery for making ornaments (such as arms, supporters, borders,

“ cyphers, and all manner of flowers and other ornaments)  
“ to add to the flowers for coaches and other carriages.”

This invention is meant “ chiefly for a quicker dispatch of  
“ business, therefore such ornaments, in general as aforetime  
“ mentioned are to be pierced with a saw, or otherways cut,  
“ in copper plates, brass, tin, or any other metal or com-  
“ position, stamp or silver compound, foil, mother-of-pearl,  
“ paper, vellum, prepared canvas, leather, thin wood, paste-  
“ board or card paper, as shall be thought most proper for  
“ that purpose; when pierced, then to be painted thereon  
“ with divers sorts of colours, gilded, glazed, bronzed, inlayed,  
“ embossed or coloured, as may be most approved of, to be  
“ fixed and laid upon all manner of coach and other carriages  
“ after the ground colour is laid and finished; and that the  
“ said copper plates, brass, tin, or any other metal or  
“ composition stamp, silver compound, foil, mother-of-pearl,  
“ paper, vellum, prepared canvas or leather, thin wood,  
“ paste-board, or card paper, with the painting thereon, after  
“ being pierced with a saw or other ways cut, are to be put  
“ on and take off and fix on any coach, or any other carriage  
“ when required, or when the ground of a body of any coach  
“ or other carriage shall or may be wanted to be new  
“ painted, gilded, or varnished.”

[*Printed, 3d. No Drawings.*]

A.D. 1775, August 1.—No. 1101.

O'KEEFE, OWEN.—“ A new and particular carriage for  
“ coaches, chariots, chaises, waggons, and all other vehicles  
“ to be used with four or three horses.”

In this invention the body of the carriage or other vehicle  
“ (instead of being hung with springs bolted or standards  
“ framed or bolted to the fore transum uniting pieces or horn  
“ bar) is hung by springs or standards which project from  
“ the perch or shafts under the body, so as the body may  
“ hang on stiff braces, or with shackles or iron work, without  
“ a fore transum, or what is called an under carriage. The  
“ perch bolt or turning plate is in the perch or centre  
“ between the shafts or perches, nearly under the fore part  
“ of the body in the carriage with a joint or plates contrived



“ to let the fore wheels lock even with the side of the body,  
“ and not before the body, as common.”

[*Printed, 3d. No Drawings.*]

A.D. 1775, November 28.—No. 1109.

TAYLOR, WALTER.—“ A great improvement in the construction of wheels for all manner of carriages, and which invention and improvement consisted of four parts, viz., first, in the boxes; secondly, in the naves or stocks; thirdly, in the spokes; and, fourthly, in securing the reems of the wheels.”

As regards the boxes this invention consists in the application of—“ two slides passing through grooves into the inner end of the naves or stocks and boxes, which slides clasp round a groove formed in the arm of the axeltree for that purpose, and which said slides meet so as to form a close joint,” these slides not only keeping the wheels in their places, but also preventing the escape of lubricating matter from and the access of dirt to the boxes. The latter “ when cast close, or stop at the outer end of the same, should have one or more screw or screws thro’ the naves or stocks and boxes that go into a groove in the axeltree arm, which is an additional security to keep the wheel on its axis, and the naves or stocks and boxes together, and also admitts the oil into the boxes.”

“ The naves or stocks are made of wood, iron, or other metal, into which the spokes are screwed or fastened (if made of wood it must be thro’ an iron hoop, and which must be fixt on the said naves or stocks for that purpose) between flanches, with nutts and screws or rivets.”

“ The spokes are made of iron or other metal as well as wood. If made of iron or metal they should be fastened to the fellies or reems of the wheels by an iron hoop or pieces of iron that go round the under part of the fellies or reems of the wheels, thro’ which the spokes are screwed or rivetted, and to which the fellies or reems of the wheels are also fastened; or the spokes may be made by a separate flap or strap being put at one end of the spoke, by which the same is fastened to the fellies or reems of the wheels by screws or rivets. The fellies or reems of the wheels

“ may be further secured by a circular piece or pieces of  
 “ iron, grooved in each side of the said fellies or reems of  
 “ the wheels, and the whole rivetted or screwed together.”

[*Printed, 3d. No Drawings.*]

A.D. 1778, May 29.—No. 1193.

MARTIN, JOSHUA LOVER.—“ A chain belt fastened by a lock  
 “ of a peculiar new construction, whereby all trunks are not  
 “ only effectually secured from being cut away from carriages,  
 “ but the lock itself such as cannot be picked.”

This invention consists in the first place of a “new con-  
 “ structed chain strap or belt” for the purpose of securing  
 trunks and other articles to carriages. This chain strap  
 is composed in the first instance of links “of an oblong  
 “ square figure” made of iron or any other metal, which  
 links are, or may be, “joined together with plate iron,  
 “ copper, brass, tin, &c. &c.” This chain is described as  
 being covered with leather, and so having “every appearance  
 “ of a common strong belt,” the ends of which are connected  
 together by a lock which forms another part of the invention.

This lock, and the key by which it is meant to be operated  
 upon, are minutely described, the lock including various  
 springs, notched pieces, branches, and other details which  
 will only be correctly understood with the aid of the drawing  
 annexed to the specification.

[*Printed, 6d. Drawing.*]

A.D. 1780, March 16.—No. 1248.

CLAGGETT, CRISPUS.—“ A new travelling machine,” which  
 the patentee styles “the Imperial Mercury,” and which is  
 intended for “the greater convenience and accommodation  
 “ of travellers, and which is more commodious and better  
 “ adapted for the purpose of travelling than any carriage  
 “ hitherto invented or at present in use.”

“ There are three carriages or machines comprehended in  
 “ the invention, viz., the carriage No. 1 is divided into four  
 “ equal parts, No. 1, 2, 3, 4, carrying two passengers each,  
 “ and is so planned and constructed as to give each number  
 “ distinctly in the interior parts every appearance and  
 “ superiour accommodation and elegance of a post chaise or

“chariot, and externally the form and appearance of one complete carriage at large, perfectly uniform in all its parts, and may be entered either at the fore or back fronts or sides. There are separate doors, with locks and keys to each compartment. In the interior parts are partitions, with glasses and doors of communication from one number to the other, as occasion may require. In the bottom of the carriage is framed an iron security box, inseparable with the carriage, for the perfect security of jewels, writings, and other valuables, the entrance to which is from the inside of each number respectively;” another branch of the invention embracing a well, “with holes in ditto, for carrying game, &c. Each number is distinctly and severally lighted from the roof by lamps, on an entire new construction and invention, in manner and form following, that is to say:—The first lamp is affixed to the roof of the machine with springs, equally illuminating the road and carriage at same time, and the light may be withheld instantly from one or both at pleasure, and are of equal advantage respecting those carriages following, as, meeting, the words Imperial Mercury (or any device) are done transparently in the circular part of each lamp, and have a most striking and pleasing appearance on the road.”

“The carriage No. 2 falls under the same description as No. 1, without the least variation, excepting only that No. 1 and No. 3 in this machine carries one passenger only, which numbers in every respect imitate a vis-a-vis.”

“The carriage No. 3 exactly the same as No. 1 and 2 in construction, manner, and design, excepting there are only two parts in this machine, No. 1 and 2 carrying two persons each.”

[*Printed, 3d. No Drawings.*]

A.D. 1780, June 14.—No. 1258.

SOMERTON, WILLIAM.—“New invented friction boxes for all sorts of wheel and other carriages, for ship-work, house-work, nutt-work, and engines and machines of every kind.”

This invention, according to a “plan” with certain notes which form the specification, consists in the first place of

an axle box having six sides, "but bearing on the axle " only on three sides," the spaces between them being meant for the reception of oil or other lubricating matter. In another arrangement the sides of the box, instead of being plain, as in the first arrangement, are "all convex," the convex parts bearing upon the axle, and the angles forming receptacles for oil or grease. Another modification of the invention is described in which the box has only five sides, and the invention is mentioned as extending "to any number " of sides or parts of bearing either in lines parallel to the " axis or in the form of a screw or circle, as also to such " boxes as are of equal diameters at both ends as well as " such as are of a conical form."

[*Printed, 6d. Drawing.*]

A.D. 1780, September 15.—No. 1264.

BULL, MARK. — Umbrella support for carriages, &c. The invention is thus described:—"There is a base & socket of " steel or iron, or any other metal or composition. The ball " moves in any direction, and is fixed by one, two, three, " or more points, which are forced against it either by a " screw or spring. The ball is made with small cavities to " receive the points which press against it. In order to " secure it the more effectually in the ball, there is a hole " which receives the one end of the staff of the umbrella, " which is secured in it either by a spring or screw, or a " sliding or spring bolt. The umbrella may be taken away " from the staff, and either put under the seat of the saddle, " or fix'd before the rider. The staff may be made hole or " in two pieces, the one to slide within the other, in order " to raise or lower the umbrella, and be fix'd either by a " spring or screw. They are fix'd in the head of the saddle, " and cover'd by a top, without making the saddle appear in " the least different from what they are now made."

[*Printed, 3d. No Drawings.*]

A.D. 1782, March 9.—No. 1320.

NEWCOME, AUGUSTINE.—"A new method of making wheels " for coaches, chaises, and other carriages, the naves and " spokes consisting wholly of iron, or in part of iron, brass, " or other metals, and which would be of public utility."

“ The nave is made of any sort of metal, such as wrought  
 “ or cast iron, brass, or bell metal, and lined in the main  
 “ bore with a socket throughout of iron, brass, steel, or other  
 “ metal, or bushes in each end, of any sort of metal, wood,  
 “ or leather. The spokes are made of the best tough wrought  
 “ iron, drawn gradually taper throughout, and may be made  
 “ either round, square, octagon, or any other shape. A  
 “ screw is cut at each end of the spoke, and the biggest end  
 “ of each spoke is substantially screwed into the nave. One  
 “ or more thin washers or rings of iron or brass are screwed  
 “ or fastened to each spoke at a small distance from the nave,  
 “ to prevent the spokes moving or starting out of the main  
 “ nave. A strap of wrought iron is then screwed on the  
 “ extreme end of each spoke, of a sufficient length for  
 “ the end of the strap of one spoke to reach the end of the  
 “ strap of the next spoke, and so as in themselves to form  
 “ the whole innermost circle of the wheel; but for heavier  
 “ carriages it is necessary for the straps to lap over each  
 “ other, for the greater strength of the wheel. The main  
 “ or outside rim or tire consists of one whole sound ring,  
 “ made of the best tough wrought iron, and fixed upon the  
 “ innermost circle of straps; the holes in each rim to fall  
 “ opposite each other, and are tap’d for short screws, the  
 “ heads of which are placed on the inside of the wheel, three  
 “ or more between each spoke, by which the inward and  
 “ outward circles or rims are firmly united or drawn to each  
 “ other; and, if necessary, to prevent the noise of wheels  
 “ running on pavement, a thin piece of wood or leather may  
 “ be screwed in between the inner and outward circle of the  
 “ wheel.”

*[Printed, 3d. No Drawings.]*

A.D. 1782, October 2.—No. 1338.

JORDAN, WILLIAM, and SWINTON, WILLIAM.—“ Making  
 “ and constructing the wheels of carts, waggons, coaches, and  
 “ chaises, that should be more durable and beneficial to the  
 “ public, and free from the defects and expenses of repairs  
 “ attending the wheels then in use.”

This invention relates to both “ cast metal wheels ” and  
 “ wrought iron wheels.” The rims, spokes, and naves of the

cast metal wheels are in each wheel to consist of "one entire piece of good gray cast iron, or of copper, brass, or other metal," or of a mixture of metals, such wheels to be cast from suitable models or patterns, and, if desirable, surrounded by wrought iron hoops, secured thereto by rivets.

The wrought iron wheels may be of any form and strength required, and are constructed by rivetting or screwing the spokes into an inner rim, the points of junction being further secured by brazing with copper or brass and borax, and then casting the nave, which may be composed of iron, brass, or any other metal, or a mixture of metals, around the inner parts of the spokes, a tire of wrought iron being then placed, in a heated state, around the inner rim, and secured thereto by rivets or screws, such tire consisting of either one complete ring or hoop, or of several separate pieces. These wheels are each provided with a central bush, the latter being furnished with snugs or projections on the exterior, which enter grooves formed in the nave for their reception, and being composed of hard cast iron, or of brass or other metal, being also wrapped in leather which has been dipped in linseed oil, and then driven into its place in the wheel, and secured there if necessary by a screw. Such a bush may be "hollow within," and be furnished with an opening through which oil or grease may be poured, and, lastly, "caps, similar to those on common wheels, must be rivetted or screwed on the nave."

[*Printed, 3d. No Drawings.*]

A.D. 1783, January 22.—No. 1353.

GODSAL, PHILIP. — An invention "by which steps with treble, double, or single treads for approaching or getting into coaches, chariots, pheatons, or any other kind of carriages by the mere act of opening and shutting the doors of any such carriages be let down or taken up into a space contrived for their reception at the bottom of such carriages."

[*No Specification enrolled.*]

A.D. 1783, February 1.—No. 1355.

JACOB, JOSEPH, the younger.—"A method for the better constructing of carriage wheels and wheel carriages."

These “new constructed patent wheels are composed of the same materials as those in common use for coaches, carts, waggons, and other carriages, and like them consist of a stock or nave in the centre; a discretional number of spokes and fellies proportioned to the size and strength of the wheel, are shod with iron.”

The spokes “are framed in the same manner as for wheels on the common construction, but the fellies which compose the rim, instead of abutting against each other as in common wheels, are united and firmly joined together” by means of certain “laps or splices.”

A mode of putting together a wheel with twelve spokes is set forth in which the patentee directs that in the first place the spokes are to be framed in the nave or centre, and the “nocks or tenons for the fellies” prepared “in the same manner as for common wheels.” Then, he says, “to ring them bore in the fellics, beginning with No. 1,” “and proceed in the following order, No. 2, 3, 12, 11, 7, 8, 9, 10, 6, 5, 4, then wedge them up as common, and shoe them with iron in hoops or sheaths, as occasion may require.”

A “pipe box, made in two divisions, lengthways, of wrought iron or steel, screwed or rivetted together to receive the arm of the axis in the centre of the wheel,” is described, as also another pipe box the two parts of which are connected by means of iron hoops, these being so arranged as to “receive the arm of the axis in the centre of the wheel.” And a “splintree iron” is described “which, being made in two lengths,” and united by means of a male and female screw, “may be shortened or lengthened at pleasure.”

[*Printed, 5d. Drawing.*]

A.D. 1783, March 22.—No. 1360.

MATTHEWS, GEORGE.—Making cast iron ties and axletrees &c. malleable. The articles are first cast in moulds of the required pattern. If it be a tire “you make the circle of the wheel in eight parts.” The articles are then put into “close ovens covered with charcoal” which burns for twenty-four hours. The articles are allowed to remain till cool. These tires are fixed by nails or screws, put in through holes made at the time of casting.

[*Printed, 6d. Drawing.*]

A.D. 1783, May 3.—No. 1366.

DRIVER, WILLIAM.—This invention relates to an excavating or digging machine fitted to a wheeled carriage. The following is the inventor's description of his apparatus. There is also a table of references to a drawing, which however is not on the file.

“The figure at the top, as drawn in perspective, doth represent the machine and apparatus in question as a three-wheeled cart or carriage, under which is placed an engine nearly like a common plow, the particular form of the wheel and body of the vehicle and plow shear as invented, and making part of the new construction, appear in the said perspective; besides which there is a plan of the loading wheel as invented, and a section of one of the boxes or receptacles in the same wheel, and also a plan of the bottom and back of the body of the carriage respectively.

“The manner in which the whole works together is such that by drawing the whole forward and directing the plow into the substance to be broke up and loaded, the shear of the plow raises and turns the stuff into the cavities of the receptacles in the invented loading wheel, which in the revolution receives the stuff thrown up, and as it receives it, and brings it up, empties the contents of each receptacle into the body of the machine at the hollow of the top, which is levelled up nearly close to the loading wheel, so as to receive the same, and fenced 'so as to keep the same from scattering; and thus the performance of taking up and loading is effected by throwing open the flap or doors, which form the bottom of the body of the carriage effected. And then as to unloading, that is performed by throwing open the flapps or doors which form the bottom of the body of the carriage, effected by means of the bolt, which bottom and bolt, together with the form of the back, and a chain by which the said bottom is lifted up again when the contents of the body of the machine are discharged, are shewn in the plan of such bottom, disjoined from the perspective, and which and back shews the shape of the body of the carriage as found the most convenient mode of shaping it, which in the figure is flatt at bottom, and on each side, and is round like the bouge of a cast in the back and front,



“ though the shape of the body of the cart is not material.  
 “ The machine may also have two loading wheels and a  
 “ double plowshare, so as to throw up and load on both  
 “ sides. When the cart or carriage is loaded, the plow is  
 “ unhooked and disjoined, and the carriage of the contents  
 “ perform as in a common cart.”

[*Printed, 4d. Drawing not on roll.*]

A.D. 1783, October 25.—No. 1393.

HATCHETT, JOHN. — “ New invented art or mystery for  
 “ coaches and all other carriages and bodies of them, that is  
 “ to say, the bodies made for all pannels to put in and to take  
 “ out when required; lining the same; to have two setts of  
 “ pannels to each body; the one sett richly ornamented and  
 “ slightly varnished, lining, answerable to take out and to  
 “ put in; the other sett finished plain for travelling; the  
 “ pannels for those and all other bodies, new or old, pre-  
 “ pared in a particular manner for strength and neatness  
 “ and conveniency, and to stand any climate or any sort of  
 “ weather, as follows:—To be mahogany pannels, or any  
 “ other sort of wood proper for the use, prepared with oils  
 “ and varnish [colours, and to be laid all over, on one or  
 “ both sides, with a strong canvass straign’d on and well  
 “ work’d: when they are dried to be prepared and filled up  
 “ with oil, varnish, and colours, and japan the wheels for the  
 “ said coaches and all other carriages; the felleys reduced in  
 “ length or kept to the usual length as required; and instead  
 “ of the joints of the felleys coming between the spokes,  
 “ which is done in common to all wheels now in use, the  
 “ joint between the two felleys come to the center of each  
 “ spoke, so as to have a firm bearing, and each joint to be  
 “ cross by edge plates rivetted.”

This invention is thus set forth:—“ All the pannels made  
 “ to put in and to take out when required; separate frames  
 “ fixed on the panels and rabbetted into the framework of the  
 “ body, and fixed on with screws fitted and screwed in with  
 “ plate nuts, to take out and screw in when required; the  
 “ lining made to fix on straining frames laced on to the backs  
 “ of frames or stiched on the poof, laced on, to take off and  
 “ put on at pleasure; the pannels for those bodies and all  
 “ other bodies of carriages, both the upper and lower pan-

“ nels, to be made of mahogany, rattan, or any other sort  
 “ of wood proper for the use, prepared with oil and varnish  
 “ colours mixed with white lead, yellow or stone oaker, or  
 “ any other strong bodied colour, laid all over on both sides,  
 “ the pannels, with a canvass, linen, tin foil, flox, tow, paper,  
 “ or any other sort of materials as will hold the grain of the  
 “ wood together, to be well pressed or rubbed on ; then to be  
 “ thoroughly dried ; afterward to be filled up with oil and  
 “ varnish colour or japan, &c., and mixed with white lead  
 “ yallow or stone oaker, or any other strong bodied colour,  
 “ till the threads of the canvass are entirely covered ; then  
 “ put into a stove room and thoroughly dried ; or in summer  
 “ time, by the sun and air ; then ground down till it bears a  
 “ smooth and even surface.”

“ Instead of iron loops fixed to the body as usual at bottom,  
 “ to have wood or iron polls or springs fixed through the  
 “ back between the lining and pannels and accross each side  
 “ to the standing pillar under or above each elbow, with loops  
 “ or shackles, or round the pole only, to receive braces or  
 “ chains which hang perpendicular, or near upon it, from the  
 “ springs of the carriage ;” various advantages being mentioned as arising from this part of the invention.

According to another modification of the invention the wheels may have the felleys “ reduced in length, or kept to the usual length, if required, instead of the joints coming between the spokes, the felleys to meet and join over on the center of each spoke ; each joint to be crossed with edge plates behind and before, and rivetted together.”

[*Printed, 5d. Drawing.*]

A.D. 1783, December 8.—No. 1405.

ABERY, JOHN.—“ A new constructed coach box, to be fixed  
 “ to the bodies of coaches, chariots, and other carriages,  
 “ whereby the carriage is rendered considerably lighter to  
 “ follow the horses, and the coachman rides equally easy  
 “ with the passengers, and is no obstruction to the front  
 “ lights.”

In this invention a frame of iron, covered with leather, is fixed on each side of the front of the carriage by being screwed into the front pillars. “ A piece of wood is placed from one iron to the other, and is boarded, which forms

the coachman's seat. The two irons may either be placed at the extremities of the front, where no light is wanted from the front, or at any distance from the corner pillar, leaving "room for the seat, in which case a glass is made on each side of the box," the arrangement being such that the coachman is entirely hid from the passengers, either in a coach or chariot; and the box, being fixed to the body, rides equally easy with them. The foot board may be fixed either to the boot or the body, according to pleasure of the maker, and the boot made of any shape or size. By this method of fixing the box, &c., the carriage is rendered much lighter to follow the horses, as the perch may be considerably shortened."

[*Printed, 5d. Drawing.*]

A.D. 1783, December 17.—No. 1408.

PLAYFAIR, WILLIAM.—This invention relates to cutting pieces of metal into certain determinate or uniform shapes, and giving to such pieces of metal figured or ornamented surfaces; articles being thus produced which will serve for a variety of purposes, including "ornaments for coaches, chariots, chaises, phaetons, whiskies, and other wheeled carriages," as well as for furniture and other structures.

This invention is carried into effect by causing the piece of metal to be operated upon to pass between cylinders or rollers to which rotary motion may be given by any suitable means, one or both of such rollers being provided with indentations or hollows which give to the metal the requisite figured surface. When both the rollers are furnished with indentations both sides of the metal will be thus ornamented, but when it is desired to ornament one side of the metal only one of the rollers only is provided with indentations, the other roller being plain. "Beads or husks" may thus be produced in detached pieces, and be then united "by means of hollows made in the flat side of the husks or beads by means of a fine saw or other tool through which wire or string is made to pass," and is fixed therein by rivetting or soldering, this part of the arrangement being applicable to connecting metal beads, husks, or leaves, which have been formed by other means, "so as to make festoons or other ornaments of

“ metal which have heretofore been made in one piece by  
“ casting or otherwise.”

[*Printed, 5d. Drawing.*]

A.D. 1784, January 28.—No. 1415.

MOORE, FRANCIS.—“ A four-wheel'd carriage upon a new  
“ construction,” and “ more commodious, easy, and safe than  
“ any hitherto known or made use of.”

This invention relates in the first place to the construction of a travelling or stage coach, each end of the body of which is of octagonal form, and is provided with seats for three or more outside passengers, the seats partaking of the octagonal form, and thus affording more room for the passengers than would be the case if the latter sat in line, as usual. These seats are moreover made so as to “ open with flaps ” for the introduction of goods into recesses or boots beneath them, and which may communicate with spaces below the seats inside the vehicle. The seat of the coachman is supported by “ irons ” which project forward from the front of the vehicle, but he may, if preferred, ride on the front of the coach with the passengers. In the door of the coach are blinds or sashes, “ which open outwards, like a casement upon hinges, to “ prevent the air from coming in too violently when the “ carriage is in motion against the wind,” a certain cross bar and stay serving to adjust these blinds or sashes to any angle at pleasure. Certain other stays, having rack teeth, and acting in combination with straps or chains and rollers or cranks, serving to prevent the body of the carriage “ from “ sinking when persons get in or out,” this apparatus working in conjunction with the carriage steps. Certain springs are also arranged below the body of the carriage, and are provided with shackles to which the traces are connected, this arrangement rendering the carriage less liable to sudden jolts and checks than when the traces are connected to the sides of the coach as usual. The perch of the carriage is divided, the parts being bent “ like a double crane neck,” the patentee stating that by this means “ the wheels will lock with more “ advantage than can be done with a straight perch.” The sides of the coach may be straight, or the body may be widest in the middle, and the ends may, if preferred, be oval instead

of being octagonal. A "pleasure coach" is described in which the middle portion of the octagonal front is so arranged that the coachman, box boot, and horses are not seen by the persons inside the vehicle, who may, however, see the country from certain windows on each side of the front.

Another part of the invention relates to so hanging the body of a phaeton or other vehicle that should the wheels and perch be overturned the body will not overturn also, but will be deposited on the ground "horizontally upon the bottom," this being effected by the use of shackles or loops and framework acting in connection with the bearing springs of the carriage. In order to prevent oscillation of the body of the carriage, owing to its being thus suspended, certain straps or braces are connected to the lower part of the body and also to a roller which is so combined with certain springs and a detent that the body of the carriage is kept steady until the whole vehicle is thrown into such a position as to be in danger of overturning, when the detent is liberated from the roller by a pendulous weight, and the straps discharged from the roller and perch, the body of the carriage then swinging into such a position that should the wheels and perch be finally upset it will be deposited on the ground in an upright position.

[*Printed, 9d. Drawings.*]

A.D. 1784, May 19.—No. 1434.

LYDFORD, ROBERT.—"A pipe box, conically fluted, for all " sorts and sizes of wheel carriages, by which they will run a " thousand miles or more with one greasing," the arrangement being such that "the dispersion of grease is equal and " gradual to every part, and, from the construction of the " boxes, is prevented from working out," various advantages being mentioned as attending the use of the invention.

The invention is thus specified:—"My said new invented " pipe boxes, conically fluted, are made of different kinds of " metal, viz., cast iron, wrought iron, bell metal, brass, " copper, &c., and of leather."

[*Printed, 3d. No Drawings.*]

A.D. 1785, January 12.—No. 1459.

EDGEELL, JAMES.—“New invented axle or center pin, proper  
“and fit for the wheels of coaches, chaises, waggons, carts,  
“and all other wheel carriages.”

According to this invention the axles or center pins are made of iron or steel, “all of which is applicable to one wheel  
“only, and goes through or is affixed in the stock or nave  
“of such wheel, and is borne or supported at each end of  
“such stock or nave by a bar or rail being placed for that  
“purpose on the outside of the wheel as well as on the inside,  
“so that each wheel turns on its axis within a frame at each  
“side of the body or bed of the carriage by means of which  
“support at each end the said axles are strong, and yet much  
“smaller than has hitherto been accustomed or used for  
“wheel carriages.”

*[Printed, 3d. No Drawings.]*

A.D. 1785, November 10.—No. 1508.

BERRIMAN, ROBERT.—“An intire new apparatus for the  
“purpose of supplying carriage and all other kinds of wheels  
“with grease, without taking them from the axle, and  
“whereby they will be enabled to run considerably longer  
“without fresh greasing than by any other mode hitherto  
“practised.”

In this invention the stock or nave of a cart or carriage wheel contains a “box” for the reception of the arm of the axle, the interior of the box being provided with variously formed recesses or hollows which aid the circulation of the oil or grease used for the lubrication of the axle, a reservoir being formed or fixed at such end of the stock or nave for the reception of the oil or grease, and the reservoir at the outer end of the nave being provided with an opening for the introduction of the lubricant, such opening being furnished with a screw plug by which it may be closed. This opening is placed directly over the linch pin of the axle, and is so contrived that it may be used to remove the pin from its place when desirable, a screwed rod being then inserted into such opening. Inside the reservoir on the inner end of the nave is a collar or washer which is placed loosely upon the axle, and serves to defend the inner shoulder of the axle and

the end of the box from injury by friction; another collar being fixed on the axle outside the réservoir which assists in preventing mud and dirt from splashing into the box, the neck or rim of the inner reservoir being bent inwards with the same object. The outer reservoir forms a cap which entirely encloses the outer end of the axle and the linch pin, the latter being furnished with shoulders by which it is kept in its place. Collars of leather are also placed at the ends of the box, where the latter run into the reservoirs, and the result of the whole arrangement is that an efficient lubrication of the whole arm of the axle is maintained.

[*Printed, 9d. Drawing.*]

A.D. 1785, December 9.—No. 1514.

SHANKSTER, JOHN.—Axles and axletrees. The invention relates to an improvement in axles and axle boxes, by the use of which friction is intended to be diminished. The wheel is securely attached to the axletree, the arm of which, or the portion outside the wheel, runs inside an internal box, which also works upon a central pin or spindle in an external box or bracket frame. The axletree arm “turning six turns faster or more on an average than the internal box, consequently has little or no friction.”

The axletree is made in two parts, working inside a tube, so that each wheel revolves independently. Modifications of this improvement are shown.

[*Printed, 5d. Drawing.*]

A.D. 1786, June 13.—No. 1546.

MOORE, FRANCIS.—“A coach with two wheels on a new construction and new springs, which by being fixed in a new method, with the addition of new braces, would sustain or carry such coach, or any other coach, chariot, chaise, or other carriage mounted upon two wheels, with greater ease and safety, and might be drawn with fewer horses than usual.”

In this invention the door of the carriage is placed in the back part of the body, the carriage being supported upon two wheels only. The “new springs” are composed of curved springs which project upwards from a piece of metal welded to a crank or corner upon the axle behind the centre of the

wheel, the upper ends of these springs carrying braces which extend downwards diagonally and are connected at their lower ends to loops or shackles by which the body of the carriage is supported ; various advantages being set forth as arising from this part of the invention.

The axle is cranked backwards inside shoulders which are upon the arms of the axle, inside the naves of the wheels, this arrangement causing the bed of the axle to pass below the body of the carriage about a foot behind the centres of the wheels, the springs, as already mentioned, rising from pieces of metal which are welded to this cranked part of the axle, such springs being secured by bolts and nuts.

Below the body of the carriage are "wells or holds" for the reception of luggage, there being a space beneath them to prevent them from striking the axle in the event of the carriage body vibrating backwards and forwards. On the outside of these wells are check or body springs, which fall or bend down withinside, and rise up again like hooks on the outside of long vertical collars or rollers, placed upon bolts or spindles which are sustained by stays fastened to the frame or side of the carriage or the bed of the axle, these springs having in their eyes bolts or bars which are pressed by them against the long collars or rollers, and the result of this arrangement being that the body of the carriage is prevented from swinging sideways.

A "carriage side frame or double perch" is set forth as being screwed to straps which are welded to the under side of the axle, the hinder part being prevented from settling by means of a stay. Upon the front part of this frame is mounted the coachman's seat, as are also the cross and splinter bar, rollers, pole, and shaft, and upon this frame, behind the body of the carriage, is also a platform, from each side of which steps may be lowered at pleasure, so as to give access to the door of the carriage ; these steps, when turned up, being covered by a board which keeps them dry, such board then forming a part of the platform. At the back part of the latter is a standard or guard, but in cases in which a footman will not be required to stand behind the carriage the platform may be dispensed with, and the steps so arranged as to lead to the carriage door without the intervention of the platform.

[*Printed, 6d. Drawing.*]



A.D. 1786, August 5.—No. 1552.

SKIDMORE, JOHN.—Ornamenting carriages, &c., by setting or inlaying the outsides with “foil stones, Bristol stones, “paste stones, or any kind of pinched glass, lapped glass, or “composition.” The “stones” may be arranged in borders round panels, or may constitute devices, badges, &c. They are secured by cement in recesses cut or drilled for them, or they may be “set in collets or settings, as other jewellery.”

[*Printed, 4d. No Drawings.*]

A.D. 1786, October 10.—No. 1561.

MEARES, ROBERT.—“New invented swivel and socket for the “perches of four-wheeled carriages, which prevents their “being overturned, and makes them run easy.”

“The swivel and socket is made of iron and other mettall, “and is affixed to the perch, which is divided into two lengths “for that purpose between the perch bolt and the hindermost “axle, by means whereof the foremost part of the perch turns “with the rising of a foremost wheel, and the hindermost “part of the perch turns in like manner with the rising of “a hinder wheel, and thereby prevents a hindermost wheel “rising suddenly whilst the foremost wheel passes over an “obstruction and leaves the foremost wheel to run safely on “the road whilst the hindermost wheel passes safely over the “same obstruction.”

[*Printed, 3d. No Drawings.*]

A.D. 1786, November 29.—No. 1574.

BESANT, JOHN.—“Certain improvements in wheel carriages, “by means of which they are less liable to overturn, will “follow with less draft, go down hill without distressing the “horses, and have less friction on the axletree than any now “in use.”

According to one part of this invention a small lever is mounted in such a position that the driver of the vehicle may easily operate upon it with his foot, a strap passing from this lever through the front boot, and being attached to another lever, one end of the latter being made to work in connection with a catch at the back of the “sway bar,” and prevent the fore carriage from locking whenever the driver

thinks it desirable. Another strap is connected to the back of the boot by means of a chain, this strap passing under the body of the carriage and over a roller, and thence to a lever which is in connexion with a "gripe" or break passing round the nave of one of the hind wheels of the vehicle, the result of this arrangement being that when the body of the carriage inclines forward on descending a hill its pressure upon the strap causes the gripe or break to act upon the wheel and so retard the progress of the vehicle. The perch is in two parts, so put together that one part passes for some distance longitudinally over the other, certain springs being arranged in combination with these parts, and the patentee stating that the result of the arrangement is such that the action of the body of the carriage "assists the horses." The body of the carriage is supported both before and behind by braces and loops in connexion with circular springs, the arrangement being such "that the overturning of the carriage will only set the body down on its bottom between the fore and hind wheels when they lay flat on the ground."

An axle box and arm are described in which the box is so formed that the spokes may be dovetailed into it. The arm is provided with a collar, which is enclosed in an aperture in the inner end of the box by a plate which is secured to that end of the box by bolts, and a tube passes from the axletree bed through the collar, and forms the means of distributing lubricating matter upon the axle arm. The box is apparently lined with metal, and in the outer end of the lining is a screw which bears against the end of the arm, and serves to tighten the arm when such end becomes worn.

[*Printed, 7d. Drawings.*]

A.D. 1787, January 6.—No. 1580.

GARNETT, JOHN. — "A method of greatly reducing the friction of an axis or fulcrum, useful for all axles, wheels, beams, levers, pendulums, blocks, pulleys, and other instruments that have a partial, total, or repeated revolution or oscillation."

According to this invention an axle is surrounded by a ring, of much greater internal diameter than the diameter of the axle, such ring being called a "container," and there being

placed within it a number of rollers which are of sufficient diameter to extend between the axle and the interior of the ring, but do not touch each other, being kept apart either by rings furnished with holes or notches for the reception of the axes of the rollers, and such rings, where great strength is required in the apparatus, being connected by bars which extend from centre to centre of the rollers, or the latter may be kept apart by means of chains or bands or other analogous contrivances, or by means of smaller rollers interposed between them. If this apparatus is placed within the nave of a carriage wheel, the container and rollers will revolve around the axle, and the rollers act as anti-friction rollers. The container may, however, be attached to the body of the carriage, in which case the rollers will only revolve on their own axes, the axle turning in unison with them. If the axle be hollow another axle, of any form, may be placed within it "and reposed on and within any soft or elastic substance." The invention may be applied to various purposes. The rollers may be either cylindrical or conical.

[*Printed, 5d. Drawing.*]

A.D. 1787, March 1.—No. 1592.

GOTTLIEB, VALLENTINE.—"A considerable improvement in the construction of wheels and axletrees, which is calculated to decrease the friction, and consequently to diminish the labour, in all sorts of carriages, and may be applied to machinery of other kinds where wheels and axles are made use of."

This invention consists in the first place in forming in the arm of an axletree a longitudinal groove, this groove being for the reception of a roller of steel or other hard substance, the nave of the wheel enclosing this roller, which is on the lower side of the axle arm, and the latter resting and working upon such roller which thus serves as an anti-friction roller. The groove in the axle arm should not extend quite to the end of the arm, but the latter should be left solid for some distance from the end, in order to receive the screw and lynch pin by which the wheel is kept in its place.

The details of the invention may be varied; in some cases a number of small rollers work in combination with one larger roller. The inner part of the axle arm is provided with

a large collar or washer which not only serves to steady the wheel but keeps dirt from getting into the working parts, and a small pipe passes from an oil reservoir through an opening in this washer and conveys oil to the arm and roller or rollers.

[*Printed, 6d. Drawings.*]

A.D. 1787, May 8.—No. 1599.

BRODIE, ALEXANDER.—“New-invented iron tier for all sorts  
“ of wheel carriages, whereby the wheels will be much  
“ strengthened, and thereby rendered more durable than by  
“ any tier heretofore made or now in use for wheel carriages,  
“ and whereby the highways and roads will be greatly pre-  
“ served,” and also meadows and other grounds saved from  
“ rutting or being cutt by the wheels of such carriages, and  
“ whereby the horses and other cattle drawing such carriages  
“ will be eased of their draught, and the wheels greatly pre-  
“ vented of throwing up dirt and soil against the carriages.”

According to this invention an iron tire is formed “either  
“ immediately from melted iron, stone, or melted cast iron,  
“ or from wrought or hammered iron.”

In preparing to cast a tire suitable patterns are prepared not only for the parts of such tire but also for the spokes of the wheel, the spokes being apparently meant to be formed first, and the tire then cast upon or within them, the inside of the tire being “nearly flat, with a rim or ledge on each  
“ side, of a depth and thickness suitable to the size and  
“ thickness of the wheel, and rounded off on the outside at  
“ the edge, over the rim, with a gentle rising from such  
“ rounding towards the middle, or square inside and outside.”

In forming a tire of wrought iron the metal is in the first place cut into suitable lengths and then operated upon by rollers suitably formed until brought into the requisite shape, the tire being in this case also furnished with rims, and fastened upon the wheel by nails, rivets, or screws, having been first placed thereon in a heated state and pressed thereto by cramps. A similar procedure is adopted with regard to securing a cast tire upon a wheel, the holes for the screws or rivets being, however, formed in a cast tire during the process of casting, while in the case of a wrought iron tire they are

formed by drilling. The patentee mentions, however, that these tires being provided with rims renders them capable of being attached to the wheel with fewer screws or rivets than usual.

[*Printed, 5d. Drawing.*]

A.D. 1787, May 12.—No. 1602.

GEORGE, WATKIN.—Anti-friction axle. In one form of axle, the axis is surrounded by a number of rollers or cylinders which revolve in the reverse direction to the revolution of the axis, or, if the axis be stationary, of the nave or “container.” Each alternate cylinder is smaller than the others and bears at its ends on rings or flanges on the covers of the box or “container.”

“ In another form “ every cylinder shall be nicked down or “ made smaller in some places than in others, or notches “ made at any convenient distance from each other, so that “ the projection of one cylinder will move in the notches or “ grooves or cavities in the others.” “ So the chief principle “ is, their moving one in the other without touching each “ other to cause friction.”

[*Printed, 6d. Drawing.*]

A.D. 1787, August 11.—No. 1618.

DAVIS, JOHN.—“ A new method of hanging coaches, *vis-a-vis* “ and other bodies, so that in case the carriage should be “ overturned, the body will remain upright and free from the “ ground.”

In this invention a certain block in the first place supports a large spring of curved form, the ends of which project upwards and are connected by means of loops or shackles to a circular frame of iron, certain stays proceeding from this frame and sustaining the hinder part of the body of the carriage, while a similar arrangement supports the front part of the carriage and the driver's seat. In the shackles or loops connected to the circular frame are notches for the reception of a bolt or catch, suitably mounted, there being in combination with this part of the apparatus a pendulum and certain other mechanism, and the result of the whole arrangement being that on the framework of the vehicle tending to be

overturned, the body of such vehicle will always be retained in a vertical position.

[*Printed, 5d. Drawing.*]

A.D. 1787, October 6.—No. 1623.

SHANKSTER, JOHN,—“New method of hanging of coaches, “chariots, phaetons, calashes, gigs, chaises, and other carriages,” whereby the lives and limbs of persons travelling therein “are rendered more safe and secure than in or by “any other carriage heretofore made, built, and hung for “the carriage or conveyance of persons travelling and otherwise conveyed thereby.”

According to this invention the axle of the vehicle apparently projects from each side of the body of the vehicle, about midway thereof, the arm of the axle on each side passing through a bearing which projects from the top of a cylindrical piece of metal mounted upon a pivot, and the two together forming what the patentee terms a “jointed swivel,” the whole resting upon a shackle or loop which unites the upper ends of two springs the lower ends of which are connected to the carriage framing, and certain small bolts preventing the arm of the axle from moving longitudinally in the bearing for more than a limited distance. An iron box or frame is described as having a bolt passing vertically through it, the lower end of the bolt being forked, and, when the box or frame is affixed to the body of a carriage, clipping the perch, or a roller or rollers mounted upon the perch, the object of this bolt being to prevent the body of the carriage “from “overturning when entered by passengers, or from being “affected by any bias through their sitting on either side;” a certain ball, certain moveable inclined planes which the patentee terms flyers or regulators, and other minor apparatus being so arranged that should the carriage, from any shock or obstruction be near overturning the bolt will be drawn up, making it “quit the perch and suffer the body to find its “center.” These arrangements may be varied, in some cases the bolt being made to strike into a box or frame instead of clipping the perch or a roller or rollers therein. One arrangement is described in which a circular box contains a wheel and two shifters or regulators, the arrangement being

such that when there is danger of the carriage being overturned the bolt will be drawn up as already mentioned.

“The coachman’s seat and footman’s standing board may by this invention be suspended and kept free from danger by the spindles which proceed from the body being made longer, and having square ends on which may be slipped square eyes to fit, to which irons the seat and standing board may be, agreeable to fancy, elevated or kept very low.”

[*Printed, 6d. Drawing.*]

A.D. 1787, November 2.—No. 1626.

COLLINGE, JOHN.—“Making of carriage and other wheel boxes and axletrees, which will be more durable and less liable to be out of order than any now in use.”

This invention consists in the first place of “a pipe wheel box” which is lined at each end with cast or wrought steel or any other hard metal, or “lined in any other form upon the same principle in any number of pieces, or cast solid in any hard metal, with one or more internal projections or bearings for the arm of the axletree to lay upon, to diminish adhesion and friction, and contain oil or grease beneath.”

The arm of the axletree is surrounded by a case or cover of hard metal, or “partially covered with any number of cases, either all round or on the under part, to effect the same purpose and diminish adhesion and friction.” Another part of the invention relates to a cap or reservoir for the reception of oil or grease, to be placed at the inner end of the wheel nave, this being provided with an aperture for the insertion of such oil or grease, and a screw stopper for closing such aperture. A plate or bar which is meant to “cross the outer end of nave” for the point of the axletree cap to bear against is also described, as well as another cap or reservoir for the reception of oil or grease and which is meant to enclose the outer end of the wheel nave, and which will if required, also serve the purpose of the plate or bar mentioned above. An ornamental plate for covering the face of the cap is also set forth, as well as certain pins, bolts, and nuts which serve to unite the parts and keep them in their places. The friction between the arm of the axletree and the inside of the pipe box may also further be reduced by the

introduction of loose collars which will work within the box instead of the case or cover already mentioned, and a third kind of cap or reservoir for the reception of oil or grease is set forth which is provided with "an aperture in the center" to permit the end of axletree to pass through to receive a "nut on the outside by which it is secured."

[*Printed, 6d. Drawing.*]

A.D. 1788, March 21.—No. 1643.

HATCHETT, JOHN. — "Making carriages on a new construction for coaches, chariots, vis-a-vis, curricles, one-horse chaises drawn on wheels, and also sleds without wheels, chiefly used in Russia, Holland, and other countries subject to much ice and snow."

In this invention two curved standards are in the first place so arranged as to rise from the bed of the hinder axletree of a carriage, these standards supporting a cross bar which may either be of such length as merely to reach from one standard to the other, or so as to project beyond them, and the ends thereof "answer for legs or supporters when the wheels throw over." On the centre of this bar is also fixed a box in which works a swivel, this being connected to a standard which descends to the perch, the arrangement being such that "the perch will swing clear between the wheels." Connected to the lower end of the standard is also a curved "sweep" furnished with a tongue which enters a groove formed in another sweep connected to the bed of the axletree, these arrangements enabling the middle frame of the carriage and body to "poize themselves," certain levers, stay braces, and springs, aiding to produce this effect. On the swivel mentioned above is fixed a toothed wheel, and over the box in which the swivel turns is another toothed wheel, placed horizontally, there being connected to this latter wheel a circular plate having a flap or hand projecting from it, the result of this part of the arrangement being that on the carriage being thrown out of its equilibrium beyond a certain point the hand so acts upon one or other of the levers already mentioned and the apparatus in connection therewith that the body of the vehicle, with the coach box, platform, and footman's stage "resume their perpendicular situation."



The arrangements in front of the body of the vehicle are of similar character to those already mentioned. The pole of the carriage rises and falls with the motion of the horses, the "splintree" bar or bars to which the pole is connected being made to turn in sockets. A "draw out support" is mounted below the body of the carriage, "to prevent the body from giving too much under by the weight of the person on the step," this part of the invention being applicable to old carriages, and friction rollers are applied to the perch and behind the boot, "to prevent the swivel from being strained."

In the construction of chariots, vis-a-vis, and phaetons, the same system is adopted, but the body of a phaeton may be suspended more forward in the framing than in the case of a coach. In the case of curricles and one horse chaises the hind ends are to be made as in the first arrangement mentioned above, "with this difference; instead of a perch, the two shafts are to be suspended from a swivel in the same manner, and to swing clear between the wheels, and when required to be lighted on the horses to use an axletree called a spit axletree," the patentee apparently meaning by this an axletree of which the middle part is bent or cranked backwards from the ends.

In the case of a "sled" the body is to be suspended in the same manner as the body of the carriage first mentioned, the saddle for the driver turning with the swivel, a lever reaching from the saddle to the foot stage "to swing with the body," there being also "a spring catch and a pedal lever to it, fix'd to the foot stage, to stay the leaver from under the saddle, and which is to be discharged at pleasure by the foot of the driver treading on the pedal lever."

[*Printed, 8d. Drawing.*]

A.D. 1788, May 5.—No. 1649.

BEAUMONT, JOHN.—Driving waggons, &c. This invention relates to several matters, amongst which is an improvement in driving coal waggons. The waggon is fitted with a large horizontal toothed wheel which is put in motion by a pinion, worked by a hand winch. The large wheel shaft puts in motion another toothed wheel which gears with pinions on

the axes of the wheels. Consequently when the winch is turned the wheels are caused to revolve and the waggon moves.

[*Printed, 6d. Drawing.*]

A.D. 1788, July 8.—No. 1658.

YATES, JAMES.—“Multiplying engravings or chasings on all kinds of metals, particularly applicable to the engravings or chasings in the ornaments of coaches,” &c.

“The design is engraved on a solid block of steel, iron, copper, brass, or other mixed metal, made in any form or size required. It is then fixed in a dye of iron, steel, or other metal, which dye has a ring or collar round it so as to form a kind of dish, the ring on the outside of which raising higher than the engraved block. A forcer or block of metal is then impressed upon the engraving, and with thin plates of soft tin or lead or mixed metal, is laid under a stamp or press, by the force of which a perfect impression is made from the engraved block. Thin plates of metal, of gold, silver, plated metal, copper, brass, or other mixed metals, are then impressed or stamped, and the raised side of the impression of the engraving is then filled with melted metal of lead, tin, or other mixed metal, or hard cement, to any thickness required, so that the reverse side has the perfect appearance of the original engraved block or pattern, and any number of impressions may be taken off. For some purposes a steel, iron, or other metal roll is engraved of any design required, and an impression taken off by another counter roll of metal, and then plates of thin metal of any kind are passed between the rollers by force of a mill, and the raised side of the impression is afterwards filled with metal, &c., as before described.”

[*Printed, 3d. No Drawings.*]

A.D. 1788, August 12.—No. 1662.

DUCREST, CHARLES LEWIS.—Making carriages, sedan chairs, &c. of paper. The body of the carriage is made by pasting paper over a mould covered with canvas, until the necessary strength is obtained. The mould or form is then taken to pieces and removed and the canvas taken from the paper.

The edges of the body are strengthened for the doors and windows by small strips of wood, covered with paper. The doors and window frames are similarly made of wood and paper. When dry, the body is varnished, sprinkled with pumice powder and steel filings and again varnished. "The axletrees are either of wood, making part of the carriage, or of copper or iron, and then each axletree is of two pieces, each piece composed of the fuzee and the tail which goes seven or eight inches into the carriage." The wheels are of light wood. The naves are entirely of paper pasted together and constructed on the fuzees of the carriages, which serve as moulds." The spokes are covered with paper from the end next the naves to two thirds of their length, the other part of them to the fellies are of wood only."

When constructed, paper is again pasted over the carriage and varnished. The parts liable to friction are protected by plates of iron or copper.

[*Printed, 4d. No Drawings.*]

A.D. 1788, September 12.—No. 1669.

ISHERWOOD, JOHN.—"A certain improvement on all carriages, coaches, chaises, carts, &c., but especially carriages with two wheels, consisting of a new-invented lock or drag that acts in a superior manner to anything hitherto used or known."

This improved drag consists in the first place of two bent "cheeks," placed some little distance apart and connected together by means of spurs and cross bars, and sustained by a wheel which is apparently meant to run upon the ground in front of one of the wheels of the vehicle, the cheeks themselves partially embracing the latter, and being further maintained in position by a stay which extends from them to one of the axles of the carriage. The ends of the cheeks are provided with chains, which are passed round the felloe of the wheel when it is desired to lock the latter, and secured in that position by "slip links." The chains are connected to the cheeks by means of loops, and by the use of the slip links, which are provided with suitable "fingers," they are made to act upon the wheel or are disengaged therefrom at pleasure.

[*Printed, 6d. Drawing.*]

A.D. 1789, August 27.—No. 1697.

NORTON, JAMES.—“A profluvium box, for the purpose of  
“supplying carriage and all other kind of wheels with oil,  
“by which means there is a constant flowing, or flux and  
“reflux.”

In the absence of the drawing which appears to have been originally annexed, or meant to be annexed to the specification of this invention, it is difficult to give an accurate description of the invention, which is set forth under various modifications. One of the main features of the invention appears from the specification to consist of a “spring ketch” which may be operated upon by hand when it is requisite to introduce oil into a receiver with which the nave of the wheel is provided, a funnel being used in the introduction of the oil, and various arrangements of ribs, channels, mortices, and other details being mentioned as applicable to the purposes of the invention. The latter is set forth as being “applicable  
“to all sorts of wind or water mills, steam engines, cranes,  
“blocks, capstones, and all machines turning on an axis or  
“a pin for any purpose whatever, and which may be made of  
“wood, or any kind of metals.”

[*Printed, 3d. Drawing wanting.*]

A.D. 1789, November 7.—No. 1710.

GOUT, RALPH.—“Certain machinery for the purpose of  
“measuring distance, and which will not only ascertain with  
“the greatest precision the number of miles a person travels,  
“but will also afford security to the passenger in a carriage  
“and preserve the body thereof from injury, in case either of  
“the springs or any part to which they are attached should  
“break or give way.”

The main feature of the invention appears to consist in the employment of a tooth which is connected to a plate carried by the nave of one of the wheels of the carriage; this tooth, at each rotation of the wheel, acting upon certain cranks, chains, wires, and other apparatus, and so giving motion to a “pedometer,” which, according to one of the numerous figures in the drawing annexed to the Specification, is provided with a dial, having one large face within which are

three smaller faces, no particular description of this dial, however, being given.

The invention includes certain “supporters of ironwork, “which not only conduct every revolution the wheel makes “to the pedometer,” but also serves as a preventive against accidents, the arrangement being such that “if an accident “should happen whereby the springs or leathers should “break, the carriage could not fall against the wheels, there “being full six inches space between the carriage and wheels, “and the ironwork being in centre of the six inches must “of course keep it full three inches from the wheels, which is “not the case in other carriages.”

An “equestrian pedometer” is described as being applicable to a saddle, pillion, or other article, used by a person riding on horseback, for the purpose of showing “the exact “number of paces a horse shall make in any rate of travel- “ling.” There is nothing in this part of the invention, however, which belongs to the subject of the present series of abridgments.

[*Printed, 7d. Drawing.*]

A.D. 1789, November 10.—No. 1711.

LYDE, GEORGE.—“Coach trumpet.”

A metal tube is adjusted inside the roof of the carriage, under the lining or not as preferred. One end passes through the front of the carriage to the other, at about the middle of the roof, is attached a mouthpiece. This mouthpiece hangs from the tube by a flexible or universal joint, so that it may be carried to any part of the carriage, and when not in use, is kept out of the way by a hook or spring.

[*Printed, 3d. No Drawings.*]

A.D. 1790, January 20.—No. 1723.

HOOPER, SAMUEL.—Artificial leather for carriages, &c. Scraps, cuttings, and parings of leather are converted into pulp in an engine, after having been previously washed. When great smoothness is required, size is mixed with the pulp. The pulp is pressed in wire or metal moulds, again pressed between sheets of felt or like material, dried, and finally pressed or rolled to give a good surface.

[*Printed, 3d. No Drawings.*]

A.D. 1790, February 23.—No. 1727.

HANDS, SAMUEL.—A “method of ornamenting all kinds of  
“ buckles, straps, coaches, chaises, phaetons,” &c.

The invention consists in “making and in laying any or all  
“ of the above-mentioned articles with ornaments made of  
“ gold, silver, and all other metals, glass, pearl, ivory, or  
“ other substance whatever, inlaid by cutting, drilling, chasing, or pressing; and those inlaid by cutting, drilling, or chasing, are fixed in or upon the article intended to be ornamented with a cement, but with respect to those pressed the ornaments are fixed upon the article with a glutinous substance, rivet, screw, or any other fastening, and then the whole is put into a pair of moulds made to the shape or form of the article intended to be made and ornamented, which article is softened by making the moulds hot in water or steam, and then the moulds are pressed together till the ornaments remain perfectly secure and fast in the article intended to be made and ornamented.” The patentee also causes any kind of ornaments to be stamped, sunk, or engraved in the moulds above mentioned, which by being pressed gives the impression desired, and whether such impression be raised above or sunk below the surface the same may be inlaid or not at pleasure.” He likewise causes ornaments of the like kind and nature to be made and inlaid in horn or any kind of pulp by the like or similar processes for the above-mentioned uses.”

[*Printed, 3d. No Drawings.*]

A.D. 1790, July 28.—No. 1767.

BESANT, JOHN.—“New invented carriage, so constructed as  
“ to save in the labor of horses, to be less destructive to roads,  
“ and better calculated for the conveyance of merchandize  
“ and the accommodation of passengers, than any now in  
“ use.”

This invention is described under various modifications. The first consists of a carriage having six wheels and three sets of springs, and having also a slider or moveable centre which admits of “the shortening and lengthening of the  
“ under carriages when any of the wheels drop into a hole or  
“ have to raise over an obstruction.” In another case the

carriage has eight wheels and three sets of springs, with one slider. In another case the carriage has ten wheels, and two sliders, placed fore and aft. And another carriage is described as having twelve wheels, and three fore and aft sliders, it being proposed that this carriage shall have a chimney in front, and be divided into two or three compartments, "or that a family of fifteen or twenty, by sleeping by turns, may travel for months or years without leaving the carriage." A carriage of this description may be variously modified, one arrangement being set forth in which the body of the carriage is divided into three main portions, these resting upon framing which is braced together by diagonal rods, and the perches and other mechanism being so contrived that the vehicle may easily turn. Such a carriage may be adapted for the transport of merchandize as well as of passengers. The springs of all such vehicles may be either connected directly to the under framing, so that the bodies of the vehicles may rest upon them, or they may be so arranged that the bodies may be suspended from them by means of chains. And such vehicles, if made of sufficient size, may be used as pleasure houses, suttlng booths, or dining rooms, and may rest upon twelve, or fourteen, or more wheels.

A carriage is mentioned as being "a double carriage, which may have from eight to forty-eight wheels in length and breadth," an end view of this carriage being given, from which it would seem that such a carriage is meant to have the axles made short, and be arranged in pairs, each axle having upon it two wheels, the carriage moreover being provided with apparatus which answers the purpose of sails, and which will, upon the wind being brought to act upon it, either serve for the propulsion of the carriage, or greatly aid the horses in such propulsion. The patentee mentions that post chaises, and all other four-wheeled carriages may, at very little expense, have the additional advantage of two, four, or more wheels, and that the seats of carriages made according to this invention may, if desired, be arranged "after the manner of seats or galleries in theatres."

[*Printed, 9d. Drawing.*]

A.D. 1791, October 12.—No. 1829.

SHARPLES, JAMES.—Antifriction axles. These improvements relate to various devices for the purpose of reducing friction in machinery. The principle lies in the interposition, between the revolving axis and the bearing point, of a series of rollers, so arranged that the axes of one bear against the periphery of the next, and so on. By adjusting the relative proportions of bearing surfaces the friction is reduced. The bearing point of the system is so contrived as to adjust itself to the line of thrust.

The invention is shown applied to the axle of a carriage. Each wheel is secured to the axletree, which is in two parts, so that each wheel revolves independently of the other. The two portions of axletree are set at an angle to one another to provide for the proper portion or inclination of the wheel. They are stepped in the centre of the framing, where they are free to revolve. Adjoining the nave of the wheel and on the inner side, a set of antifriction rollers, as described above, is fixed so as to bear on the rotating axle.

[*Printed, 5d. Drawing.*]

A.D. 1791, November 26.—No. 1840.

LEEDHAM, WILLIAM.—“An improvement for preventing the splinter bars of wheel carriages from being out of order.”

According to this invention “the splinter bar is to contain in front a rod or bar of iron (or other metal), the ends of which are to pass through the splinter bar sockets for the purpose of each receiving a nut or key; the rod or bar thus stationed is to be confined in the middle of the splinter bar by one (or more) bolts, screws, or rivets, and such extremity of the rod or bar prepared for and supplyd with a nut, bolt, key (or other instrument), that will by its force or pressure applied thereto cause the splinter bar to remain straight; or the fore side contracted, for the purpose of keeping the wheel irons tight to the axletree and splinter bar and free from noise.”

[*Printed, 3d. No Drawings.*]



A.D. 1792, February, 11.—No. 1851.

BARBOR, WILLIAM.—“ Certain machinery for the purpose  
“ of hanging of doors and windows or lights in a manner  
“ entirely new, particularly those of coaches, chariots, and  
“ other carriages.”

According to one part of this invention a carriage window has screwed to each lower corner of its frame an angular plate, each plate having a stud projecting horizontally from it, and there being on each stud a grooved pulley and also a plain pulley. To each grooved pulley is connected a line or cord, one end of the cord passing around it and being formed into a noose, and these cords, when the window is lowered, pass upwards and over grooved guide pulleys, and thence again descend to a balance weight which is placed in a recess in the carriage door, and which is equal or nearly so to the weight of the window, with its frame, angular plates, and pulleys. The object of this arrangement, apparently, is that the window may be raised and lowered into any given position with very little exertion, the plain pulleys, moreover, acting as antifriction rollers. When the window is entirely raised, however, the lines or cords connected to the pulleys on the frame pass backwards from the grooved guide pulleys over other pulleys in order to allow the window to pass over the “ fence of the middle rail ” of the door, the antifriction rollers then turning upon a semicircular frame or casing, which is above the grooved guide pulley. If the window is too deep to allow the balance weight to rise to a sufficient height the weight itself may be furnished with carrier pulleys, and the line lengthened and be passed around such pulleys, being then attached to the door rail instead of to the weight itself.

Another part of the invention relates to a concealed or secret door hinge, which consists of one flap, from which a curved arm projects, and another flap furnished with a projection having a recess therein for the reception of the end of the curved arm, a pin here uniting the projection and the arm. The flap carrying the projection has an opening through which the arm passes, and this flap is let into the door pillar, while the flap with the arm is attached to the door itself, a cavity being also formed in the pillar for the reception of the

curved arm, and the result being that when the door is shut the hinge is invisible.

[*Printed, 9d. Drawing.*]

A.D. 1792, May 25.—No. 1885.

MARCH, JOHN.—“ Making a coach, chariot, landau, berlin, “ phaeton, post chaise, one horse chaise, and caravan, upon a “ new construction, the bodies of which cannot overturn, and “ which in other respects are more safe and convenient than “ any carriage now in use.”

This invention embraces a large number of details. A chariot is in the first place described, the body of which is not mounted upon the springs in the ordinary manner, the springs rising to a considerable height both in front of and behind the body, and the latter being connected to them by what the patentee calls a “ central suspension,” the object of this apparently being that should the vehicle be overturned the body will be deposited on the ground in an upright position. A futchell is fixed to the front axletree, which turns upon a wheel plate and is joined to a transum by means of a perch bolt. Certain springs and rollers are set forth as being placed below the body of the carriage, apparently for the purpose of preventing such body from swinging improperly from side to side owing to its “ central suspension,” and both the coachman’s seat and the footman’s standing board are also mounted on springs, there being also a “ spring seat ” for the inside of the vehicle which is supported by hooks and straps, as well as other seats or stools inside the vehicle which turn upon hinges so as to be raised or lowered at pleasure, and likewise a “ drop “ table.” Pointed “ dragstaffs ” are also set forth, the pointed ends of which are apparently meant to be lowered to the ground so as to check the progress of the vehicle when requisite, these dragstaffs being capable of turning in different directions, and so obstructing the movement of the vehicle either forwards or backwards. A lanthorn is described as being capable of turning in a socket, and so arranged as to give light both within and without the carriage, and the steps of the carriage are furnished with a “ hinge stay,” which, when they are let down, descends with them, and rests against a “ crane ” or projection from the perch of the car-

riage, the body of the carriage being thus prevented from "making any angle" when persons are getting into it. The "imperial" is fixed to the body of the carriage by means of a single screw bolt, which also serves to lock such imperial.

The front axletree and perch bolt are of iron, "all in one piece." The arms of the axles are grooved, and the axle boxes are provided with holes through which oil may be introduced into the boxes, such holes being furnished with screw bolts or plugs by means of which they may be closed. Certain "scapes" are mentioned as being employed for the purpose of liberating the horses from both the splinter bar and the end of the pole when necessary, these "scapes" apparently consisting of certain levers, catches, and other apparatus which may be acted upon by means of strings leading from them to the interior of the vehicle, and a "drag shoe" is set forth for the purpose of being applied to one of the wheels of the vehicle when going down hill. Certain locks for the carriage doors are also set forth, and also a chain which is provided with a hook at one end and a swivel bolt at the other, and which is to be used for fastening a trunk upon the top of the carriage.

The details of the invention are partly set forth in the body of the specification itself, and partly by means of short descriptive sentences written in connection with the numerous figures in the drawings annexed to the Specification, and many of the details are such that they will only be clearly understood with the aid of such drawings.

[*Printed, 9d. Drawings.*]

A.D. 1792, June 6.—No. 1886.

VULLIAMY, BENJAMIN.—Two-wheeled carriages.—Part of this invention consists in fitting such carriages, intended for use with two horses, with a pair of shafts in addition to the pole. These shafts may be hinged laterally to the draught bar. The pole is supported by the horses by means of suitable harness, which, being also attached to the shafts, tends to prevent overturning of the vehicle.

The invention also relates to an arrangement of spring shafts or poles. Plate springs are fitted into the shafts or poles near

their extremities, and means are provided for controlling their action. The supporting springs of the carriage are attached to the blocking which fixes the shaft to the axletree.

[*Printed, 10d. Drawing.*]

A.D. 1792, July 17.—No. 1899.

COLLINGE, JOHN.—“New invention of and improvements  
“in and upon carriage and other wheel boxes and axle-  
“trees.”

According to one part of this invention, an axle box is formed which is cylindrical in the interior for the principal part of its length, there being at each end of the cylindrical part an enlargement or “female cone.” At the verge of the female cone at the inner end of the box is a reservoir for oil, this being partially enclosed by a ring or partition, the end of the box beyond the female cone being greatly increased in size, and there being a “marginal recess” outside the partition into which a leather ring or washer is inserted, the front of the axletree collar also entering such recess. Beyond the female cone at the outer end of the box is a female screw for the reception of the screwed part of a cap which closes the end of the box, and which cap itself forms a reservoir for oil. Around the verge of the female cone at the inner end of the box is a projecting ring which serves to prevent the oil from the reservoir at that end of the box from passing too freely to the axle arm. The arm itself is shaped in conformity with the inner parts of the box almost as far as the female cone at the outer end of the box, but is furnished with grooves for the distribution of oil, one such groove being immediately behind the part which enters the female cone at the inner end of the box, and another about midway of the length of the arm. The part of the arm which passes through and beyond the female cone at the outer end of the box is reduced in diameter, there being placed thereon in the first instance a ring of metal which at one part fits into the female cone, this ring being secured in its place by a nut which screws on a part of the arm, an outer nut having its thread in the contrary direction, being placed beyond the first as a lock nut. A ring of leather is applied in screwing on the cap to the outer end of

the box, the cap being furnished with an opening by which oil may be introduced into its interior, such opening being provided with a screw plug. The leather ring prevents the escape of oil from the cap, and a smaller ring is placed below the shoulder of the screw plug. In addition to the cap being screwed to the end of the box, it is secured to the nave of the wheel by screws passing through a flange with which it is provided, and on the collar at the inner end of the axle arm is secured a projecting rim "to cover the prominent part of the box beyond the wheel nave, and as an additional protection from wet and dirt."

[*Printed, 9d. Drawing.*]

A.D. 1792, October 10.—No. 1909.

MUNNS, JOHN.—Carriage trumpet.—From this specification it appears that a tube is fitted in the carriage, leading from the inside to the outside, where it is provided or not as preferred, with a trumpet mouth. The mouthpiece appears to be attached to a length of tubing joined to the other in such a manner that when not in use, a spring or pulley raises it to its proper place, or to the roof of the carriage, as most convenient. The junction piece may be made to serve the purpose of a valve to shut out cold air when the tube is not in use. A tube is also described, to which two monthpieces are attached; when one is used the other must be stopped by a plug. The tube is also arranged so as to be capable of being used in communicating with both coachman and footman, and simultaneously if desired.

[*Printed, 4d. No Drawings.*]

A.D. 1792, November 20.—No. 1918.

CLAY, HENRY,—Panel for carriages.—The following are the directions of the patentee for the working of his improvements:—"Take a block or piece of slate, blue stone, portland stone, or other stone, and slit, saw, cut, or otherwise divide or make it into thin pannels or plates, which pannels or plates are then to be ground or rubbed in the manner of plate glass upon a flat stone or other proper material for the purpose, with sand and water or other ways, till the surface is become perfectly true and even; after the pannels or plates

“ are thus reduced and made very thin and even, they are to  
 “ be japanned, painted, gilt, varnished, or otherways orna-  
 “ mented, for the use of or to be used as pannels and plates  
 “ for coaches and other carriages, and the pannels or plates if  
 “ not strong enough of themselves, may be put on, be ve-  
 “ neered to, or otherways laid on with glue or other cement  
 “ upon wood, paper, cloth, or other material that will suffi-  
 “ ciently strengthen and support them for the above several  
 “ purposes; or may be put on, be veneered to, or otherways  
 “ laid on with glue or other cement upon wood, paper, cloth,  
 “ or other material before they are japanned, painted, gilt,  
 “ varnished, or otherways ornamented for pannels or plates  
 “ for coaches, &c.

[*Printed, 3d. No Drawings.*]

A.D. 1793, March 25.—No. 1942.

WILDEY, HENRY. — “ New method of improvement of a  
 “ wheel iron for a coach, chariot, chaise, phaeton, or any other  
 “ four-wheeled carriage, by virtue of a screwed box, nutt, or  
 “ eye to an improved plan to screw and affix on the fore axle-  
 “ tree, and with the aid of a screwed box nutt to receive a  
 “ screw or screws horizontally, as occasion may require,  
 “ through the fore wheel bar (commonly called the splinter  
 “ bar), and to be screwed to the inside of the said splinter  
 “ bar, will completely keep the same in its proper position,  
 “ and also prevent the fore wheels of such carriage ever com-  
 “ ing off while in action or use;” also a “ new-invented axle-  
 “ tree double box for all kind of wheel carriages, which by  
 “ means of its present construction will contain and supply  
 “ itself with oil for several months without the occasion of  
 “ being taken off to oil the same, as the common box now in  
 “ use requires.”

The double axle box which forms part of this invention consists of an inner box which works upon the arm of the axle, and has at each end an outside collar, there being about mid-way of its length a third collar of less diameter than the other two, a “ check bar ” or outer rib also passing along the box, between the two outer collars, such rib or bar being of the same height as the latter, and there being a row of holes in the box near to the bar. Outside the inner is an outer box,

this being of the same internal diameter as the collars at the ends of the inner box, and being brazed or soldered to them and to the "check bar," a space being thus left between the two boxes, which forms a reservoir for oil, such oil being introduced through a hole in the end of the outer box, and being thrown into the holes mentioned above by the check bar as the bar rotates, the holes being countersunk, and the oil passing down through them to the arm of the axle. Outside the outer box are pins or snugs which, when the complete box has been inserted into the nave of the wheel, prevent it from turning round therein. The other box is also provided at each end with an "over jett or harbour" projecting beyond the inner box, "whereby the arm of the axletree, at the linch end thereof, as well as the body end, is protected from dirt or sand getting between the box and the arm of the axletree."

The "wheel iron" which forms another part of the invention, consists of a bar which is curved somewhat into the shape of the letter **S**, one end of which is connected by means of "a screwed box, nutt, or eye," to the linch or outer end of the axletree arm, outside the wheel, the other end being provided with a "screwed box" for the reception of a screw or screws by which it is connected to the splinter bar of the vehicle. A **T** or an **L** flap may, however, be substituted for the screwed box. It is apparently meant that one of these "wheel irons" shall be placed outside both of the fore wheels of a vehicle, thereby effectually preventing such wheels from leaving the axle.

[*Printed, 6d, Drawing.*]

A.D. 1794, May 24.—No. 1991.

DE LOLME, JOHN LEWIS.—"New invented instruments or implements for the safety and convenience of wheel carriages, and also for their greater expedition, by the lessening of friction."

This invention embraces a large number of particulars, which are set forth at great length. The invention consists in the first place of a "stepper" or ladder which is to be used by persons in entering and leaving carriages, this ladder containing any requisite number of steps, and being hinged at

the upper end to the carriage, or to suitable apparatus connected thereto. When not in use the stepper is turned backwards below the body of the carriage, and retained in that position by a catch, such catch being liberated, when the stepper is required for use, by pulling a wire (which may act upon the catch through the medium of a crank or cranks, or otherwise), the stepper then swinging downwards and forwards, and assuming a position in which it is suitable for use, being prevented from returning backwards by means of other catches which are brought to bear against certain "hanging pillars," which project downwards from the carriage, and which retain the stepper in position while required for use. The different catches, as well as the stepper itself, may be aided in its operation by means of springs or weights, and the arrangement may be such that a person in the carriage, by pulling at one wire or string, may liberate the steps from below the carriage, in order to descend therefrom, and upon returning to the carriage may, by pulling at another wire or string, liberate the catches which have been sustaining the stepper in its forward position, and cause it again to retire below the carriage. These arrangements are set forth at great length, and under various modifications, different forms of catches, along with certain sliding hinges, sliding slips, and other minor apparatus being mentioned as applicable to the purposes of the invention, the lower end of the stepper being in some cases made to rest upon the ground in order to prevent it from swinging backwards by the weight of the person using it.

Another part of the invention relates to springs for carriages, and the main features of this part of the invention are set forth as consisting in forming the spring in the first place by bending a thin slip of steel or other metal first in one direction and then in the other until it resembles in form a flattened helix or spiral, and then connecting the upper end of such spring to some fixed point in the framing of the carriage, the body of the latter being suspended by means of a link from a vertical rod which is connected to the lower end of the spring, and which is capable of sliding up and down in suitable bearings, the patentee terming this rod and link the "sliding settler" and the "swinging link."

Another part of the invention relates to apparatus for



enabling persons in a carriage to release the horses therefrom in case of necessity. The traces of the horses are connected to the framework of the carriage by means of bolts which are capable of being raised upwards by means of a "turning piece" furnished with studs or projections, and a long lever projecting upwards to which a cord is connected and passed into the interior of the carriage. By pulling at the cord, the lever and turning piece are made to cause the studs or projections to raise the bolts, and so liberate the traces from them. The horses are at the same time disengaged from the front end of the pole by means of a long rod carried by the pole, the hinder end of which rod is furnished with a hook which is acted upon by a stud in the turning piece already mentioned, and the front end of the rod then releasing the harness from the front end of the pole, the particular arrangements for which release may be varied according to circumstances, various hooks, rings, retaining pieces, and other mechanism being set forth as applicable for this part of the invention.

The invention further consists in fixing such of the wheels of a carriage which in this case are not "dished," upon a separate axle, these axles being of such length that those of each pair of wheels nearly meet below the carriage, each axle being mounted in two separate bearings or "gudgeons," one near to the wheel, and the other near the inner end of the axle, and the ends of the axles being enlarged outside the gudgeons, and a stopper placed between them, by which means the axles are prevented from sliding to and fro in the gudgeons. The openings in the latter, through which the axles pass, being either circular, semicircular, or square, and provided, if necessary, with receptacles for oil.

Another part of the invention consists in placing a lanthorn for lighting the road before horses and carriages in such a position that none of the light therefrom can be intercepted by either the horses or any part of the carriage, the lanthorn being carried by the front end of the pole or shafts of the carriage, being connected thereto by means of a hook and a catch, which may readily be disengaged, and prevented from oscillating by means of a spring or springs, or by connecting it to more than one point of suspension, or by both. In the case of a horse "that runs single foremost," the lanthorn

may be carried by a "bow" fitting upon the horse's shoulders.

A luggage box suitable for being attached to a carriage is described, which is meant to be suspended from the axletree bed or transome, being well secured thereto, but by means which will allow the box slightly to oscillate, such box being furnished with folding doors, and arranged in the inside for the reception of a ready packed trunk or set of trunks, which are then secured in the box by locking the doors.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1794, August 12.—No. 2006.

VAUGHAN, PHILIP.—"Certain axle trees, axle arms, and "boxes for light and heavy wheel carriages."

In this invention each arm of the axle is provided with two grooves, one of which is near the end of the arm, and the other same distance therefrom, these grooves being meant for the reception of balls which serve as antifriction rollers, the nave of each wheel being provided with grooves corresponding with those in the arm of the axle, and which partially enclose the balls in the grooves of the latter. In order to enable the balls to be inserted into and removed from the nave or box and axle arm certain "dovetail" pieces of cast iron are made to form parts of the circumference of that part of the nave or box surrounding the balls, these dovetail pieces being grooved on the lower sides to correspond with the grooves in the nave or box, and being maintained in position, when the parts are in working condition, by means of wedges of wood, by the removal of which, and of the dovetail pieces, the balls can at any time be removed from the grooves.

[*Printed, 5d. Drawing.*]

A.D. 1795, July 20.—No. 2057.

EDGEELL, JAMES.—"Axles on an entire new construction for "wheel carriages carrying heavy loads, with wheels commonly called friction wheels, applied to such axles in a "method not hitherto used or applied to wheel carriages."

In this invention the axles are of iron or steel, of proper size and strength, each axle having a wheel fixed upon each end thereof, such axle and the wheels revolving together. The

axle gradually diminishes in diameter from the centre towards the ends, being round in section, and is furnished at or near each small end with a hole for a key or pin, or a screw for the reception of a nut, in order to keep the wheels in their places, "and prevent them from spreading." The arms of the axles pass under pieces of wood which support the body or bed of the waggon, and are kept in their places there by means of staples or collars fixed in the woodwork near the small ends of the axles, and the key, pin, or nut mentioned above, and also by means of wheels called friction wheels, which are applied to the axles, such friction wheels being of as large size as can conveniently be used, and working upon the axles near to the insides of the principal wheels, the patentee stating that by these arrangements "heavy loads will, on level or nearly level roads, or on railways, be drawn and conveyed from place to place with very little power."

[*Printed, 3d. No Drawings.*]

A.D. 1796, February 27.—No. 2092.

CLAY, HENRY.—"A method of making a carriage or machine for the conveyance of and for the shooting and discharging thereof coals, lime, soil, manure, stones, gravel, sand, rubbish, and other materials, in a construction entirely new."

According to this invention the body of a cart or waggon is formed in two parts which are sustained by a frame mounted upon four wheels, each part of the body being capable of turning upon a pivot or axis passing across the frame, and the contents discharged therefrom, those of the hinder part passing down between the hinder parts of the frame, and those from the front part of the body passing down between that and the other part of such body. Each part is provided with suitable tail boards and other necessary appendages, including supporters which keep them in position until it is requisite to discharge the contents from them, but which may be turned aside to allow of such discharge; certain bars being also contrived for the purpose of preventing the parts of the body from turning over too far when such discharge is being effected.

[*Printed, 9d. Drawing.*]

A.D. 1796, April 6.—No. 2103.

GODFREY, SAMUEL.—“A machine which in operations of draft and burden will relieve the labour of the animals usually employed.”

In this invention there is mounted in bearings carried by framing, which rises to some height above the wheels of the machine or vehicle, an axis upon which are two fly wheels and a toothed pinion, there being a toothed wheel on each side of the pinion, in gear therewith, and these wheels carrying on their axes other pinions from which trains of wheels proceed to two “sphero-concentric” wheels, one of which surrounds the front and the other the hind axle of the vehicle, such wheels, however, not being fixed upon the axles, but being provided with rings connected by cross bars which surround balls or spheres through which the axles pass, the balls being provided with projecting bolts or stops which enter between the cross bars, the result of the whole arrangement being that upon rotary motion being given to the axis mentioned above and the pinion thereon motion is also communicated by means of the intermediate gearing to the “sphero-concentric” wheels, the rings and cross bars thereon then acting upon the projecting bolts of the balls, and causing the latter, with the axles and bearing wheels of the vehicle to rotate also. The bolts of the balls are provided with rollers or rings which reduce the friction thereon. The perch of the vehicle is furnished at each end with a “cradle,” the position of which may be adjusted by a screw, these cradles being furnished with plates or rings and other apparatus through which the axles and their appendages pass, and which allow the axles “to turn to a sufficient angle;” certain cords or chains connected to “directing levers,” and other mechanism attached to the latter, serving to move the axles into different positions, and so direct the progress of the machine.

The bearing wheels are not fixed upon the axles, the naves being provided with catches or stops, and acted upon by projections from the axles, this arrangement allowing each wheel to make part of a rotation independent of the axle, certain ratchets, racks, or screw joints and other appendages being mentioned as provided for the purpose of liberating the wheels from the axles and again connecting them therewith when

requisite. Besides the bearing wheels upon the front and hind axles of the vehicle, there are other wheels placed upon a central axle which is independent of the others, and is meant solely to support "the principal weight or burden to be conveyed," and so relieve the other wheels to a large extent therefrom, this part of the arrangement constituting "one of the material identities" of the invention.

The vehicle may be put in motion, "either constantly or occasionally," by a windlass, or by levers, racks and pinions, or any other suitable mechanism brought to bear upon the axis first mentioned, a suitable seat being provided for the conductor or director of the machine. The axes of all the gearing are provided at the ends with balls, which rest in hollow cylinders forming the bearings of such axes, the positions of such cylinders being regulated by means of screws, and a "friction board" or break is so arranged as to be pressed at pleasure against the fly wheels by means of a cord, certain governor balls, covered with elastic material, being also so arranged as to be brought into contact with projections from those wheels in case the speed of the machine should become too great. These fly wheels may be varied in form, and may be provided either with "stop hinges in the radii or flaps on their circumference," by means of which their centrifugal force may be varied. The mechanism forming this invention appears to be meant for use in aid of animals drawing the vehicle, but not entirely to supersede the labour of such animals.

[*Printed, 1s. Drawing.*]

A.D. 1796, October 25.—No. 2142.

THOMASON, EDWARD. — "New invented and improved method of making steps for coaches, landaus, chariots, gigs, curricles, chaises, and all other carriages to which steps are used."

One object of this invention is to enable a person who may be within a carriage to raise or let down the step or steps of such carriage without the assistance of the driver, or any other person. A small stud or "nose" is in the first place fixed inside the door of the vehicle, and from the door case is also suspended a small lever, having thereon a projection

which is acted upon by the stud when the door is opened or closed, and the lever thus caused to act, through the medium of teeth or cogs with which it is provided, upon a small wheel mounted upon a short shaft, one part of the latter being of square section and passing into an opening in one side of a frame which carries a step, this frame being thus lowered by the opening of the carriage door and again raised when the door is shut, being then enclosed within the vehicle. The frame is furnished with two cross bars, and upon one of these the step turns, falling outwards when the frame is lowered, and being turned upwards when it is again raised by means of a small rod, a crank, a spring, and other minor appendages. A second and a third step may also be connected to the apparatus, and worked by means of a chain or chains passing down from the first or upper step, each lower step being mounted in a frame of its own, and one frame sliding within another when the steps are being lowered or raised. The details of the invention are very fully set forth.

[*Printed, 6d. Drawing.*]

A. D. 1797, November 9.—No. 2201.

OVEREND, HENRY.—“A certain wheel carriage or machine  
“ which may be used as a waggon, cart, or dray, in a more  
“ perfect and expeditious manner and with fewer horses than  
“ usually and heretofore done.”

According to this invention a frame composed of two sides united by cross bars is mounted upon four wheels of such size that the bars are only about one foot from the ground, although this may be varied, there being placed below the frame also “castor wheels” which are “fix’d on to the center  
“ of the bars of the machine, and like the others, neither  
“ projects outside or inside of the bars.” An iron “receiver,” or bent bar, is used to connect the shafts for the horse to the frame, this receiver being so arranged as to be capable of being placed at either end of such frame, certain pins being employed to prevent the receiver from “playing or turning  
“ beyond the limited point.”

[*Printed, 5d. Drawing.*]

A.D. 1798, January 16.—No. 2208.

ECKHARDT, ANTHONY GEORGE.—Cushions, backs and seats for carriages, &c. This improvement consists in fitting the stuffed seat or cushion in a frame resting on pivots or axes, so that it may be turned so as to bring the underside uppermost if desired. The backs are similarly arranged, and a back and a seat may be connected so as to turn together. The seat or cushion is held in a ring or frame of metal to which a covering may also be attached to preserve the cushions.

[*Printed, 6d. Drawing.*]

A.D. 1798, August 3.—No. 2254.

HALLADAY, STEPHEN.—“The draught or moving of carriages of all descriptions that move on wheels, or any thing that may be used for the draught or moving of carriages, adding or diminishing more or less wheels than the present mode; axletree, linspin, and every part of the carriage, being on a new principle; the power which is applied for the above action is entirely new,” and of the patentee’s own contrivance, “and may be applied to the above by the assistance of men or horses, and is equally applicable to mills of all descriptions, barges and boats on canals, printing and callendering of linen, and may also be applied to various other useful purposes.”

One main feature of this invention is set forth as consisting in the use of a fly wheel, which is put into rapid motion by means of suitable gearing with the view of facilitating the motion of a carriage or any other machine with which it may be connected. Various parts of mechanism applicable in the construction of a carriage are described. The axle, which may be either cranked or otherwise, is square at one end, for the reception of one of the bearing wheels which is fixed thereon, the other arm of the axle being circular in section, but tapering towards the end, the wheel thereon being loose. The axle itself revolves on gudgeons furnished with antifriction rollers, and on the axle is a toothed wheel which communicates with a train of gearing in connection with which is a fly wheel, a winch, crank, or handle, being mentioned as being applicable “to set the whole in motion,” and which

“ may be placed in any position whatever to strike with.” Apparatus which consists apparently of several broad flaps hinged together is set forth as being for the purpose of supplying atmospheric air to the bearings of the axles, such air being directed thereto by pipes, and serving to keep such bearings cool, a “perpetual greasing tube, with a worm “spring inclosed,” being, however, also mentioned. Certain shafts, which are for the purpose of assisting the fly wheel “for hand labor or for hills” are included in the details of this part of the invention, although the manner of using these shafts is not mentioned, and these details also include a “dis- “charging shaft or liberating striker, to throw off the power “applied at pleasure;” and also apparatus for steering the carriage which consists of a vertical shaft having a handle at the top and a toothed pinion at the lower end, the pinion being in gear with teeth formed upon a circle or segment which is apparently meant to be connected to the front axle of the carriage. A linch pin is also described, which is furnished with a cottar at the lower part, to prevent it from being lost.

The invention is set forth at some length, and as being applicable not only to carriages, but also to mills, ploughs, harrows, and in various other situations.

[*Printed, 11d. Drawing.*]

A.D. 1798, November 10.—No. 2266.

SHORTER, EDWARD, and ANTHONY, WILLIAM. — “New “and improved method of easing, equalizing, and facilitating “the draught of carriages of every description, and for easing “the body of carriages of every description in the hanging of “the same, and for the more securely fixing tents and marquees “and preventing the inconvenience attending the present “mode of fixing the same.”

This invention consists in the first place in the employment of a spiral spring, similar to that of a watch but of much greater size and strength, one end of which is connected to an axis or arbor, and the other to the inside of a barrel which encloses the spring, there being on the end of the arbor, outside the barrel, a snail to which a strap is connected, any weight or tension applied to this strap causing the snail and



arbor to rotate and so coil the spring around such arbor, the resistance of the spring increasing as it is wound up. Instead of a snail a pulley may, if desired, be used, the strap being coiled spirally around it, and an effect being thus produced which is nearly the same as that produced by the snail. This apparatus is described in the first place as being applied to the splinter bar or any other part of a carriage to which it may be desired to connect the traces, the result being that in case of the wheels of the carriage meeting with an obstacle in the road the resistance to the progress of the horses will not be attended with the usual injurious jerk to the traces, the spring winding up and giving out a portion of its strap, and the effort of the spring to unwind afterwards aiding the progress of the vehicle. The apparatus is also described as being applied in various forms to the main braces which support the body of the carriage, either as a substitute for or in addition to the ordinary springs. And such apparatus may also be applied "to collar braces and every other brace or support used to the body of carriages in general."

The invention is set forth under a great variety of modifications, and illustrated by a drawing containing a large number of figures. In some cases springs of the helical and also of the "grashopper" form may be used as substitutes for the spiral spring and barrel. In one arrangement, a graduated index plate is employed to show the weight of the carriage.

[*Printed, 1s. 3d. Drawing.*]

A.D. 1798, December 22.—No. 2282.

THOMASON, EDWARD.—"Improvements in the making of steps for coaches, chaises, chariots, landaus landalets, gigs, curricles, and all kinds of carriages to which steps are used."

This invention relates to improvements upon that for which a patent was granted to the present patentee on the 31st of October, 1796, No. 2142, and consists in the first place of a different mode of causing the steps to rise on the closing of the carriage door, this being effected by means of a shaft or arm which passes through the hinge of the step, and is acted upon when the door is closed through the medium of a bent

lever and a roller, the latter being carried by a piece of metal attached to the door. The steps are pulled down, when the door is opened by a chain which is connected to this bent lever and also to a loop screwed into the door of the carriage. The lower is connected to the upper step by means of jointed legs, instead of by a chain, as in the former invention, and the steps are, when folded up, held together by a hook which prevents them from rattling.

Another mode of raising and lowering steps is described in which a lever furnished with a handle is placed upon a bar fastened to the upper hinge of the steps, the latter being raised and lowered by moving such lever, this arrangement being set forth as more particularly applicable to "gigs, "curricles, landaus, and two wheel pleasurable carriages."

[*Printed, 5d. Drawing.*]

A.D. 1799, April 16.—No. 2307.

WILDEY, HENRY.—"An improved method of applying springs "to the poles or shafts of two-wheeled carriages," the invention being denominated by the patentee "an antimobile, or "destroyer of the disagreeable sensation produced by the "motion of the horses in all two-wheeled carriages, and to "remedy which the methods hitherto adopted have proved "ineffectual."

The advantages of this invention "are obtained by making "the pole, or shafts, as occasion may require, move on a "horizontal bolt or bolts passing through a socket or sockets, "or flaps, or side cheeks, which confine the pole or shafts "and a spring or springs, extending from the pole or shafts, "to the axletree; or a flap or flaps, stay or stays, socket or "sockets, bar or bars, brace or braces, or other bearing or "bearings may be adopted, on which the spring or springs "may rest, act, or move."

The patentee mentions that by these arrangements the great pressure of the fore part of the vehicle, arising from the lever which the pole forms acting on the front bars, and which exists in vehicles of the ordinary construction, "is "totally done away, and the weight made to act on the "axletree."

The invention is illustrated by a drawing, with certain explanations written thereon.

[*Printed, 6d. Drawing.*]

A.D. 1799, August 8.—No. 2337.

DODSON, GEORGE, and SKIDMORE, JOHN.—“Method of making and casting with cast-iron, brass, or mixed metal, knaves or stocks for all sorts of wheels, to be used for all sorts of carriages, as well for pleasure as for burden.”

In carrying out this invention a pattern is in the first place to be formed, suitable to the figure of the nave required, such pattern being either in one piece only, or in three for the greater convenience of moulding. The pattern is to be provided with core stays to produce the mortice holes for the spokes, and when the moulding takes place an iron spindle, perfectly smooth and round, and greased over, is to be inserted into the centre of the moulding flask, the result being that when the flask is closed and the metal poured into it a nave or stock is produced “in one piece, with a perfect cylinder, in the common way of pipe boxes.” In order to form a nave or stock with internal cavities for the reception of oil a core pattern is first formed, with the parts split and pegged together, and then turned to the exact size of the axletree arm on which the nave is to work, “swells or lumps” being then placed upon it corresponding with the cavities required in the nave, and a mould of plaster of Paris being formed from this core pattern, in which after the removal of the pattern, a core mould of metal is cast. In this mould a core of sand or loam may then be formed, and inserted into the flask in which the nave is to be cast by means of the spindle already mentioned, such core of sand or loam having projections thereon corresponding with the “lumps or swells” on the wooden pattern mentioned above, and such projections producing the required cavities in the nave. The outer end of this nave is closed by a cap screwed thereto, which cap, being air tight, keeps out dirt from the interior of the nave, and prevents the escape of oil therefrom. This cap may be of iron or brass, or of silver, or other metal, as required, and the screw thread in the nave by which it is to be secured may be formed either by the employment of a “screw core” when the nave is cast, or by dies, or in a suitable lathe. The patentee mentions that the interior of a nave thus cast will be very hard and durable, but that to remove any doubts which may be felt as to such durability the inte-

rior of the nave may be lined with a box or boxes of hard metal, holes being provided in such box or boxes for the passage of oil from the cavities in the nave to the arm of the axle. Or such a nave may be provided with anti-friction rollers in the interior, by which the friction upon the axle will be reduced.

[*Printed, 5d. Drawing.*]

A.D. 1800, May 30.—No. 2408.

TURNER, WILLIAM.—“A new machine to be applied to and  
“adopted in the construction of wheel carriages, for im-  
“proving the principle and increasing the power of the  
“draught, so as to reduce the active force necessary to be  
“employed therein.”

This invention is set forth at some length and is of a somewhat complex character. In the arrangement described certain upper traces pass from the collar of the horse employed to draw the vehicle to the ends of a splinter bar which is jointed at its middle part to a horizontal sliding bar, this bar, by the first movement of the horse in starting the carriage being drawn forward, and a catch attached thereto operating upon a certain strap or connecting rod and so turning a crank which is formed in a vertical axis on the lower end of which is a worm. The latter gives motion to a grooved nut or worm wheel fixed upon the front axle of the vehicle, and so causes the axle to rotate, and with it one of the bearing wheels of the carriage, the hole through the nave of which is square, and fits upon a square arm of the axle, the other arm of the axle being of circular section, and the wheel thereon being loose. By the rotation of the axle and the wheel first mentioned the first impulse is given to the carriage, and when the sliding bar has been drawn forward for a certain distance the latch carried by it is disengaged from the strap, and the movement of the vehicle is then continued by means of other traces, which are connected at the front ends to a splinter bar mounted at the ends of the shafts, or as to “play loosely with  
“the motion of the shoulders of the horse or other active  
“force,” and thence pass backwards and around pulleys to the arms of a “compound treddle,” with which they are connected through the medium of short links. The compound

treddle itself is composed of two arms or levers which are mounted at their outer ends on pivots carried by the framing of the carriage, the inner ends being connected to the two ends of a short link to the middle of which is also jointed the strap or connecting rod passing to the crank and apparatus already mentioned, and the motion of the shoulders of the horse giving alternate motion to the parts of the compound treddle and so continuing the movement of the crank, worm, worm wheel or nut, and axle and bearing wheel which was commenced by the action of the sliding bar and catch. The axis of the crank is provided with a fly wheel to equalize the motion, and on the axle of the vehicle is a ratchet wheel, upon which a click is brought to bear when the carriage stops, the latter being thus prevented from running backwards. This click is connected by means of a cord to the foot board, and is mounted upon a pivot carried by a quadrant shaped piece of metal from which a chain passes to the sliding bar, this quadrant shaped piece being made to draw the sliding bar back into its first position after the carriage has been properly started, a stop or brake being also provided which is brought to bear upon the fly wheel by means of a cord connected to the footboard.

[*Printed, 1s. 1d. Drawing.*]

A.D. 1800, July 8.—No. 2423.

LOCKETT, JOHN. — “Making of boxes and axletrees for  
“carriages of every description, and for lathes and grind-  
“stones, upon a new and improved plan and construction.”

In this invention a cast iron box is placed upon the arm of the axletree, a wrought iron collar is then placed and works upon the box, being fastened to the axle by means of bolts or screws. The nave of the wheel has a hoop screwed to it after being slipped upon the axletree, the patentee stating that this “completes (and is a double security  
“to) the whole work,” serving also to prevent dust or sand from getting into the boxes; the wrought iron collar being apparently intended to act as a guard to one side of the wheel, and the hoop on the nave to the other.

[*Printed, 5d. Drawing.*]

A.D. 1800, August 2.—No. 2431.

MEDHURST, GEORGE.—“ A new improved method of driving  
“ carriages of all kinds, without the use of horses, by means  
“ of an improved Æolian engine, and which engine may also  
“ be applied to various other useful purposes.”

“ The power applied to the machinery is compressed air,  
“ and the power to compress the air ” is obtained “ generally  
“ by wind, assisted and improved by machinery.” In  
order to render the invention “ universally useful ” the  
patentee proposes to adopt certain machinery and magazines  
in such manner that the latter may be charged either by  
hand, by a fall of water, by a partial vacuum obtained by  
wind, or by the use of explosive and effervescent substances, for  
the rapid conveyance of mails, passengers, artillery, and other  
articles, wind or water mills being erected at proper intervals  
along the roads for the purpose of charging large magazines  
with compressed air, the site of each magazine forming a  
“ station,” or large reservoirs of water being raised by the  
wind, &c., by the power of which smaller portable magazines  
may be charged, when required, by machinery for that  
purpose.

The details of the invention are set forth at some length,  
and embrace in the first place a single pump for condensing  
air into a magazine, which pump consists essentially of a  
solid piston connected to a rod to which are jointed two con-  
necting rods, these proceeding to cranks mounted upon axes  
on which are also toothed wheels, the latter being in gear  
with each other, and motion being given to the whole by a  
winch fixed upon one of the axes on which is also a fly wheel,  
the piston working in a suitable cylinder, having valves at  
the foot thereof, a “ double pump ” which is to be worked by  
a windmill, various levers, racks, rods, and other mechanism  
being here used, and an arrangement consisting of toothed  
wheels, a barrel spring, and a “ vibrating ball ” and lever  
with a pall at the end of the latter, being employed to adjust  
the stroke of the pistons to the strength of the wind and the  
density of the air in the magazine. Another machine is  
described in which the piston is worked by means of a screw,  
this machine being meant for use in charging small machines  
to a very high degree by hand. Other parts of the invention

embrace various arrangements of pistons and cylinders which are intended to be mounted, along with reservoirs of condensed air, in the framework of carriages, and to give motion thereto by operating upon one of the axles of each carriage. In some cases such an axle has one of the bearing wheels fixed thereon, while the other is driven round by means of ratchet wheels, this arrangement affording facility in turning, one ratchet wheel being placed upon a square part of the axle near to the nave of the wheel, and the other being attached to such nave, the wheels having "side teeth," and the wheel on the axle, which is capable of sliding to and fro thereon, being pressed into gear with the other by means of a spring.

The details of the invention include a large number of cranes, springs, levers, quadrants, wheels of various forms, and other mechanism, the various arrangements of which will only be understood with the aid of the drawings annexed to the Specification. One arrangement is described in which the motive power consists of compressed air, the compression of which is effected by the explosion of gunpowder, or the action of effervescent substances, this arrangement being applied to work the hinder axle of a vehicle resembling a phaeton, the body of the vehicle being raised to a considerable height above the perch by the application of long springs which apparently rise from the perch, the middle of the front axletree being furnished with a horizontal circle on which the front bed of the perch rests. The fore part of this circle is furnished with bevil teeth, a bevil wheel being in gear with these teeth, and this wheel apparently acting as a worm wheel also, being actuated where it is necessary to turn the carriage, by means of a worm upon the lower part of a vertical shaft having at its upper end a pulley round which "reins" are passed, by pulling at which "reins" the front axle is "set to any angle required."

[*Printed, 1s. 2d. Drawings.*]

A.D. 1800, August 2.—No. 2434.

REDDELL, ISAAC HADLEY.—"A new method of constructing  
" carriages for the conveyance of merchandize, either by  
" land or water, which carriages may be removed (either

“ loaded or unloaded) from the land to the water, or from  
 “ the water to the land, with ease, expedition, and safety.”

According to this invention the bodies of carriages are made  
 “ to any form or size required,” being composed chiefly of  
 wood, and the parts being secured together and strengthened  
 by pieces of metal, the bottoms, ends, and sides, being made  
 “ as watertight as possible.” Each carriage is mounted upon  
 a suitable number of wheels and axles, the patentee recom-  
 mending that the bottom of the carriage shall be near the  
 ground. The wheels may be arranged to work in recesses  
 formed in the sides of the bodies of the carriages, there being  
 placed over their centres, either a broad plank, or some strong  
 iron work, in order to protect them, and such recesses may,  
 if desirable, consist of narrow water-tight compartments or  
 boxes; the number of compartments, as well as of wheels,  
 being varied according to circumstances. Carriages of this  
 description may be used as boats, and a number of them may  
 be linked together and drawn along through the water by a  
 horse, being raised out of the water when they are re-  
 quired to travel on land by the use of inclined planes, and  
 being returned to the water from the land by similar means.  
 The vessels may have square ends, and may be linked, tied,  
 or grappled to each other by means of ropes or chains, by  
 which, through the medium of steam or some other motive  
 power, they may be moved in any direction required.

[*Printed, 3d. No Drawings.*]

A.D. 1800, August 13.—No. 2439.

REDDELL, ISAAC HADLEY.—“ A new method of constructing  
 “ travelling carriages, which are more safe and in many  
 “ respects more eligible than those which are now in common  
 “ use.”

According to the first part of this invention the bodies of  
 such carriages as are meant to accommodate outside passengers  
 have affixed to them “ commodious seats, at a distance from  
 “ the top, or, in other words, in as low a situation as they  
 “ can properly be placed, which seats may be calculated to  
 “ hold two or three persons each, as circumstances may  
 “ require;” there being placed, for the further accommodation  
 “ of outside passengers in general, a light covering of wood,



“ leather, oil case, or some other suitable material over the “ seats,” in order to defend them from the weather, and likewise “ a proper covering for their legs and feet, which “ may be used or not as occasion may require.”

According to another part of the invention a sufficient space is left between the bottom and the top of the carriage to admit of the inside passengers “ standing upright whenever “ they may think proper.”

According to a third part of the invention the seats of carriages are so mounted with the aid of hinges, joints, swivels, braces, and chains, that they may be leaned back or raised up at pleasure, the bodies of the carriages being adapted thereto.

Another part of the invention relates to a mode of ventilating carriages by means of a small instrument which is worked from one of the wheels of the carriage, this instrument causing fresh air to enter into and foul air be expelled from the interior of the carriage ; the air which in hot dusty weather is introduced into the carriage being forced to pass through either a small vessel of cold water or through “ a “ piece or pieces of cloth or any other material that has a “ tendency to render it more fit for respiration.”

According to another part of the invention a carriage wheel gives motion, when the carriage itself is moving, to a finger which is attached to mechanism by means of which the distance which has been traversed by the vehicle is “ pretty correctly ” shown.

Further, the invention relates to apparatus for warming passengers inside the vehicle, this being effected by means of a fire which is “ either after the nature of a lamp or promoted “ by means of any matter or substance that will burn in a “ proper manner ;” one small opening, or a pipe or tube, serving to convey fresh air to the lamp or fire, and another opening, pipe or tube serving to carry off the smoke and smell to the outside of the carriage.

Another part of the invention relates to setting free horses from carriages, the arrangement being such that the “ turning “ of the carriage out of its right position ” is made the means of liberating certain catches, sliding bolts, stays, or other equivalent mechanism, different modifications of this part of the invention being set forth.

The seat for the coachman is affixed to the front part of the body of the carriage, and may be made large enough to hold two or three persons, a boot or boots being also connected to the carriage body, as convenient. And the patentee states that in most cases he intends the body of the carriage to rest upon springs connected directly to the axles, or to cross pieces hung below them, without there being any perch, pole, or framework of any kind below such carriage body, all these arrangements being modified according to circumstances.

[*Printed, 4d. Woodcut.*]

A.D. 1801, August 31.—No. 2536.

KOSTER, JOHN THEODORE.—“A new method of building  
“ wheel’d carriages.”

This invention consists “principally in making use of shafts  
“ connected together by transoms or cross pieces, so as to  
“ form a frame or frames, in place of a perch or a crane neck,  
“ proportionate in size, strength, and exact form to the body  
“ it is intended to carry, and that the wheels run within the  
“ said frames, which will rest upon supporters of wood or  
“ metal, one on the out and one on the inside of each wheel,  
“ and these upon axis of the wheels. The hind springs may  
“ be placed either upon the shafts on the outside of the  
“ wheels, directly over the wheels, or upon the cross pieces  
“ within side the wheels, as may be found, on experience,  
“ most convenient, and the fore springs on the fore part of the  
“ carriage, nearly in the usual place. It is intended that the  
“ wheels shall run upon spindles or gudgeons that turn with  
“ the wheel in holes or grooves at the bottom of the sup-  
“ porters, but they may run two and two upon the same axle-  
“ tree, or each upon a separate axle-tree and the supporters  
“ fixed thereto, or the hind wheels may run upon spindles,  
“ and the fore wheels upon an axle-tree, if found more con-  
“ venient. It is proposed to fix the fore transom to the fore  
“ axle-tree, on the point answering thereto, by a ball and  
“ socket, to turn within or round each other, the socket to be  
“ fixed either on the axle-tree or the transom, as by experience  
“ may be found most convenient; but the carriage may be  
“ built without this contrivance, or the ball and socket may

“ be adapted to any four wheeled carriage of the usual construction. It is also intended that the wheels should be greased by a small vessel filled with oil, placed against or within the supporters, and dropping upon the ends of the spindles. By making the supporters of a greater thickness two friction wheels may be introduced, on the circumference of which the ends of the spindles may turn. The construction of a waggon, wain, or other carriage of burthen must be nearly the same; the body must be built upon its shafts and transoms, and an opening or hollow left for the upper part of the hind wheels.”

The invention is illustrated by “a plan of a frame;” a view of the fore frame, “if the fore wheels are on gudgeons;” “a side geometrical view of the carriage;” a view of “the front of the carriage, if on gudgeons, with a ball and socket;” and “one of the supporters, on a large scale.”

[*Printed, 6d. Drawing.*]

A.D. 1801, September 12.—No. 2538.

GERMAN, THOMAS.—Carriage on rollers. This invention is intended, primarily, to dispense with the necessity of replacing the rollers upon which a bulky body is moved, and which otherwise would be left behind. It also relates to the construction of a carriage running upon rollers instead of wheels.

The drawing shows such a carriage mounted on four sets of six rollers each. The rollers of a set are linked together and pass round and under bearing pieces or sledges, fixed by strong framing to the carriage. Each bearing piece or sledge always rests on two rollers, which having passed to the rear, are picked up by the links and guided over the top of the sledge to the front again. In passing over the top of the sledge, they are cleared of adherent earth, which falls into a cavity in the top of the sledge and is thence guided away from the rollers. The framing carrying the leading pair of sledges, turns on a pivot like an ordinary carriage axle. The rollers may be skidded in descending hills.

[*Printed, 7d. Drawing.*]

A.D. 1802, February 27.—No. 2587.

POTTINGER, RICHARD.—“ Engine and apparatus whereby  
“ persons riding in carriages may, on occasions and in cir-  
“ cumstances of imminent danger, liberate themselves, and  
“ escape impending mischief, by freeing the horse or horses  
“ instantly from the carriage, and in case of two-wheel car-  
“ riages by causing them to stand in the same horizontal  
“ position as they were before the horse or horses were freed  
“ from them, by the carriages stopping in the space of a few  
“ yards,” without any violent concussion or danger of over-  
turning, the person in the carriage sitting the whole time  
with perfect ease and safety.

According to this invention, for a curricule, the splinter bar is to be “ made of the best seasoned ash, with an hollow sunk  
“ in the back of it to receive an iron shaft or spindle of about  
“ half an inch diameter, in two lengths, to which must be  
“ fixed four iron hooks, one at the end of each shaft, to move  
“ in a circular position; also an iron leaver with two flanges,  
“ one of which is fixed to each shaft by nuts and screws.  
“ That part of the engine which falls to the ground in order  
“ to assist in supporting and stopping the carriage may  
“ appropriately be called the anchor, which may be part  
“ wood and part iron, or wholly of iron, and is fixed to the  
“ axletree by two couplings screwed to it at about eighteen  
“ inches asunder, or nine inches from the center of the axel-  
“ tree, projecting about one inch from the axletree, with a  
“ small hole in it sufficient to admit an iron pin of about half  
“ an inch diameter, which pin, passing through the two iron  
“ flanges attached to the anchor, as well as through the  
“ couplings, the anchor by that means moves from the centre  
“ of the small iron pin at the axeltree, the leaver resting on  
“ the anchor, as it may either be inclosed in a grove made to  
“ receive it on the upper side the said anchor, or the leaver  
“ may be so constructed as to lay on each side of the anchor,  
“ and be supported by small bolts or rollers to rest on it.”  
A small strap is so arranged in conjunction with a spring bolt  
that by pulling at the strap the bolt is made to liberate the  
anchor, the latter then staying the progress of the carriage,  
and the “ lever ” mentioned above so acting upon the hooks  
named above as to liberate the traces of the horses from the

splinter bar. In order to set them free from the pole also there is provided a leather or iron socket to receive the end of the pole, this being called the pole piece, and having connected to it certain straps, which are combined with a certain plate, a rod, a trigger, and other apparatus so arranged that in the dropping of the anchor and the movement of the hooks as already set forth the trigger sets free the horses from the pole.

The invention is mentioned as being slightly modified according to the nature of the vehicle to which it is applied.

[*Printed, 3d. No Drawings.*]

A.D. 1802, February 27.—No. 2588.

LEWIS, JOHN.—Disengaging horses. The apparatus described by this Specification is intended to be applied to all kinds of vehicles.

For two wheeled carriages, the harness tugs are fitted with loops or rings which are attached to the shafts and splintree by means of sliding or catch bolts. These bolts are all controlled by chains passing round pulleys. When drawn the horse is released, and a pair of legs or props are dropped from under the carriage to support it. The latter have little wheels attached to them to prevent a too sudden stoppage.

In the case of curricles, the suspending harness is similarly attached to the pole, and the latter has a spring at the end for the pole chains. This carriage has also props.

Two horses are similarly attached to other carriages, and when four horses are employed, the swingletree is put on to a dropping hook at the end of the pole, so that it can be readily released. The wheels of all these carriages may be fitted with ratchets on their naves, so that they may be locked at will without descending from the vehicle.

[*Printed, 9d. Drawing.*]

A.D. 1802, March 9.—No. 2590.

ELLIOTT, OBADIAH.—Spring curricule bar. This invention is described only in connection with a drawing, which however is not on the file. It appears that, for the purpose of easing the horses, the curricule bar is attached to the saddles through the intervention of springs, both on the saddles and directly

under the bars themselves. On the saddles are fixed small C springs, having "eyes on the top for the bar to slide through." The eyes are fitted with small rollers, as are also "saddle stands" for the same purpose. The invention is also described as applicable to one horse.

[*Printed, 3d. Drawing.*]

A.D. 1802, March 24.—No. 2596.

MEYER, PHILIP JAMES.—Controlling horses and locking wheels. This invention consists in fitting to the nave of the wheel a small toothed wheel which always turns with it. A barrel or drum held in bearings under the vehicle has, on one of its gudgeons or axes, a small pinion, and by means of a foot lever, this pinion may be thrown into gear with the toothed wheel on the nave. The drum will then rotate and will wind up a pair of reins thereby putting pressure on the horse such as he cannot resist. For the purpose of preventing backing, a toothed or notched strap may be dropped over the toothed wheel on the nave.

[*Printed, 6d. Drawing.*]

A.D. 1802, March 24.—No. 2599.

TREVITHICK, RICHARD, and VIVIAN, ANDREW. — Steam carriage. Part of this invention relates to the construction of a carriage for common road purposes to be propelled by steam. The engine, which is carried by the framing of the carriage, drives a crank shaft, fitted at each end with toothed pinions, which may singly be thrown in and out of gear with other pinions or wheels on the naves of the main wheels of the carriages. Thus the carriage wheels are driven and by throwing either wheel out of gear, turning may be facilitated. By attaching the toothed driving gear to the naves of the wheels, the axletree may be fixed and may be bent to suit the design of the carriage. The peripheries of the wheels may be roughened by nails or studs and may be contrived to work on railroads. "In cases of hard pull" a "lever, belt, or claw" is caused "to project through the rim of one or both of the wheels." The leading wheels are steered by a lever, and a "check" lever "can be applied to the fly wheel in going down hill."

[*Printed, 1s. 1d. Drawing.*]

A.D. 1802, March 24.—No. 2600.

WILLIAMS, JOHN.—Disengaging horses. The splinter bar to which the traces are attached, “rolls” or rocks in loops or bearings secured to the fixed splinter bar. The loops at the ends of the traces fit over the studs on the rocking bar and partly encircle the bar so that they cannot come off so long as the bar is secured. The bar is secured by means of a spring bolt pressing on the end of a curved lever, part of the bar. The bolt being drawn back by a cord, the bar rocks or rolls so as to allow the trace loops to free themselves. The pole is fitted with a moveable end or cap, to which the pole chains are attached. This readily leaves the pole when the horses are free and put a forward strain upon it. If any draught is to be applied to the pole, the cap is held on by means of straps buckled tightly to the traces. Shafts may be similarly fitted with caps when the rolling splinter bar is used. The patentee does not however claim the use of these pole and shaft caps as his invention. To prevent the end of any pole or the shafts catching the ground when released from the horses, little wheels or broad metal pieces are attached to them.

[*Printed, 6d. Drawing.*]

A.D. 1802, May 5.—No. 2615.

BAUER, GEORGE FREDERICK.—“Certain new improvements in the construction of carriages and the wheels of carriages.”

This invention relates, in the first place, to rendering the bodies of waggons much lighter than usual without diminishing the capability of such waggons for carrying heavy loads. Arrangements are set forth by which it would seem that the body of a waggon consists mainly of certain frames which cross each other, these frames not resting upon axletrees of the ordinary character, but each wheel working loosely upon a separate short axle, which is supported in bearings on both sides of the wheel, each axle being secured in its place by a nut screwed upon it, and being prevented from turning round with the wheel by a “hook-like bend” at the outer end which fits between two “eminent nails” in the framing. The patentee states that by these arrangements the axles may be

made much lighter than is customary. In order to reduce the friction of the wheels upon the axles they are in the first place bored out to such a size that the openings in the naves are much larger than the diameters of the axles, brass boxes or bushes being then driven into the ends of the naves, and these fitting and forming the bearings of the wheels upon the axles, the outer end of each bush being flanged, and slightly rounded, so as to offer little friction to the bearings of the axle on each side the wheel. Between the bushes of each nave there is thus a chamber or space around the axle which serves as a receptacle for lubricating matter. The invention is described as being applied to waggons with two as well as with four wheels, and different arrangements of the shafts and other parts by which the traces of the horses are connected to such waggons are set forth.

Several modes of constructing wheels are also described. In one case an iron "spigot" or bar is driven through the nave of a wheel, projecting therefrom at each side and forming pivots on which the wheel turns "in boxes of brass." This wheel appears to have a rim of considerable breadth, the tire being in three separate bands or rings, but another wheel is set forth in which the tire consists of one narrow band only, the tire being rounded on the exterior. Another wheel is described in which the nave consists of "one solid piece of brass," being, according to the drawing, in the form of a tube with large bosses and flanges at the ends, the spokes of this wheel being composed of straps of leather which are passed through holes in the flanges and also through holes in the inner rib of a large iron circle or ring which forms the rim of the wheel, the straps being so arranged as to be much further asunder at the nave than at the rim. These wheels, being elastic, are intended merely for carriages, "or for the transportation of sick persons." Strings or chains may be used instead of straps in forming the spokes, if preferred.

[*Printed, 9d. Drawing.*]

A.D. 1802, June 26.—No. 2630.

TATE, JAMES.—"An improvement of great importance, to be added to or used in the construction of wheel carriages."



This invention relates to an improved arrangement of friction wheels, applicable to the bearings of the axles. An axle is described which is furnished with shoulders upon which rest the edges of friction wheels which are formed into the shape of inverted cups, these cups having vertical axes passing through them, the lower ends of which work in bearings mounted above the axle, while the upper ends of the axes are themselves formed into small cups for the reception of the lower ends of screws which pass downwards from the upper parts of frames surrounding the friction wheels, such frames being connected to a cross bar which sustains the body of the carriage through the medium of springs or otherwise. The small cups in the upper ends of the axes of the larger cups form reservoirs for oil by means of which the ends of the screws are lubricated, and the frames which surround the wheels contain cisterns of oil for the lubrication of the lower ends of the axes of the wheels, the shoulders of the axle of the carriage, and the other parts of the apparatus, the arrangement including the application of friction wheels below the axle itself, the axes of which are horizontal, and which serve to sustain the axle in its proper position. The bearing wheels of the carriage may either be fixed upon the axle or be loose thereon, and in the latter case, should it be necessary to retard the movement of the carriage when going down hill, or in any other situation, a stop may be applied which will prevent the axle from turning, in which case the improvements which constitute the invention no longer being in operation, "the carriage moves on with its usual impediment of friction." The friction wheels below the axle may, if desired, be dispensed with, and a staple substituted for them; and in some cases an additional friction wheel may be placed on the top of the axle, "in aid of the other to sustain a great weight."

[*Printed, 6d. Drawing.*]

A.D. 1802, November 29.—No. 2664.

ROBERTS, JAMES, and BRINE, EDWARD.—Brakes, disengaging horses, &c.—This invention is described only in connection with a drawing which is not on the roll, and in consequence it cannot fully be understood. It relates, firstly, to a spring and screw brake applied through the nave of the wheel,

and also to a drag with "a small roller that works in the bottom part." Also to a method of securing wheels to their axles by means of screws running in grooves on the axles. The disengagement of the horses is effected by releasing a number of catches which hold the loops of the traces to the carriage. A releasing apparatus is also to be fitted to the pole. The reins may be so detained in the carriage that when the horses are released the whole weight of the vehicle will be upon their mouths. To steer two-wheeled vehicles when the horses are released, a wheel carried at the end of a bar falls down into the required position, and at the same time adjusts a steering handle. Apparatus for steering may be applied to four-wheeled carriages.

[*Printed, 4d. No Drawing on the roll.*]

A.D. 1803, January 20.—No. 2675.

JACOB, JOSEPH.—Axle box.—A plate or bar of steel is welded to a similar plate or bar of iron. The whole is then rolled to the required thickness, and bent into the necessary shape for an axle box, the steel side being inwards.

[*Printed, 3d. Woodcut.*]

A.D. 1803, February 28.—No. 2685.

MASON, ROBERT.—"Certain improvements on a common waggon, whereby the same may occasionally be separated and used as two carts," the patentee denominating the whole vehicle "The Patent Hampshire waggon."

This waggon is composed of "two distinct frames or parts," which the patentee terms "the fore and hind carts, as they correspond with the fore and hind parts of a common waggon, with the exception only as to the pole, those carts having one each; that of the fore cart turns upwards from the main pin. On the under side thereof a roller may be fixed for the sweep of the hounds to lock on until it reaches the back shudlock, to which it is secured, and extends about four inches behind the extreme thereof, which projection passes under the fore shudlock of the hind cart, through which and the said projection of the pole an iron pin is to pass, and secured on the under side by key or nut and screw." The pole of the hind cart passes from the hind

shudlock through the pillow or axletree, "turning upward to the front shudlock, being secured thereto, and extending about four inches from the extreme thereof, which projection passes under the hinder shudlock of the fore cart, through which, and the said projection of the hind pole, an iron pin is to pass," and be secured to the pole of the fore cart. These pins may be removed from the shudlocks and poles, and passed through the bed of the vehicle into the fore axletree, "to prevent its locking when used as a cart." The sides and shudlocks of the carts are united by hooks and eyes, or other substantial fastenings, such as straps with "union eyes," an arrangement of which is described. The shafts of the hind cart are united thereto in the usual way, and pass under the bed and upon the pillow of the fore cart, "the front bolt of the hounds to be brought forward near to the extreme end or nose thereof, which will tend to resist the strain in locking, as the hounds pin passes behind the said bolt in securing the shafts to the hounds." When the waggon is divided for the purpose of being used as two carts, the shafts of the fore cart are to be removed back on the hounds about ten inches, "to other holes which now come in contact for the hounds pin to pass through to secure the shafts to the hounds," the nose of the latter being thus brought nearly to the hind bolt of the shafts, but being prevented from passing through the latter by a piece of wood or metal arranged for the purpose. The shafts of the hind cart are to be fixed by means of hooks and eyes, or other suitable fastenings, and the head board of this as well as the tail boards of the fore cart may be secured by "starts" passing into the shudlocks, and, if necessary, may be secured to the "naves" also, and various arrangements of struts, hooks, tip straps, tip irons, ladders, and other mechanism may be used in carrying out the invention, which is set forth at some length and under different modifications.

[*Printed, 4d. No Drawings.*]

A.D. 1804, August 4.—No. 2777.

BROWN, JOHN.—Antifriction axle.—On each side of the nave of the wheel, the inventor lets in or secures a pair of plates or discs perforated in the centre for the axle, and having between them and surrounding the axle a series of small rollers, the

axes of which fit in holes in the parallel plates. These plates are kept a proper distance apart by studs on the screw bolts, so that there shall be as little resistance as possible to the rotation of the rollers ; and collars or washers are put round the axle, between the ends of the rollers and the cheek or parallel plates, to keep out the dirt.

[*Printed, 1s. Drawing.*]

A.D. 1805, April 25.—No. 2841.

ROWNTREE, THOMAS.—“An axletree and box for carriages “ on an improved construction,” which the patentee calls his “ mobile collar axletree and box.”

The “ mobile collar ” which forms part of this invention is a broad collar which at the inner end works upon a shoulder on the axle arm, there being within that part of the collar a recess in which a ring of leather is placed to prevent the escape of oil from that part. The other part of the “ mobile collar,” which is of smaller diameter than the part which embraces the shoulder of the axle, is furnished with a screw thread on the outside, and upon this part the inner end of the axle box is screwed, the box being larger at that than at the outer end, and being furnished with an internal thread for the reception of the thread upon the collar. The arm of the axle is slightly reduced in diameter, at a short distance from the shoulder, a second small shoulder being thus here formed, against which a conical ring is pressed by means of a nut, a short portion of the arm being screwed for the reception of such nut, and this part of the arrangement preventing the mobile collar, and consequently the axle box also, from leaving the axle arm. The box, for a considerable part of its length, is of larger internal diameter than the axle arm, a chamber being thus formed for the reception of oil, which is apparently meant to be supplied thereto through an opening in a cap which is screwed upon and incloses the outer end of the axle, the latter being also provided with a small collar, which, however, does not work in contact with the box.

[*Printed, 6d. Drawing.*]

A.D. 1805, May 11.—No. 2846.

ELLIOTT, OBADIAH.—“Certain improvements in the construction of coaches, chariots, baroush, landaus, and various “ other four-wheeled carriages.”

This invention consists in “constructing or making coaches  
“or any four-wheeled carriages without a perch or cranes.”

One arrangement is set forth in which the springs of the vehicle, which are each composed of two plates or sets of plates, one placed above the other and the ends connected by links, rest upon the beds of the axles, and sustain the body of the carriage through the medium of pieces of timber which project from the boot in front and the body of the carriage behind. This arrangement may be modified in accordance with the particular character of the vehicle to which the invention is applied. The front part of the body, or boot, is furnished with the usual “top horizontal wheel,” “for the  
“purpose of turning or locking round,” and one arrangement is described in which such “top” wheel rests upon a corresponding wheel fixed to the bed of the front axle, the front springs being secured to the same bed, as also are the futchells to which the splinter bar is connected. In another case the springs are mounted upon blocks connected with the axletrees. Another arrangement is described in which the front part of the vehicle is supported by springs placed as in the first arrangement, while the hinder springs pass from loops or sockets fixed below the body of the carriage, under the doors to blocks upon the hind axle, to which they are secured by clips or bolts, a cross spring passing in this case from one of these springs to the other, such spring being secured in the middle to the body of the carriage, and connected at the ends to the other springs by loops, shackles, or traces, “to give it  
“side play or swing if required.” In another case the hinder springs are arranged as in the case last mentioned, while the front springs consist of two side springs which are mounted upon blocks fixed upon the front axle, there being also cross springs connected to the ends of the side springs and also to the futchells, the latter being “framed into a bed fixed to the  
“bottom of the horizontal wheel.” The arrangement of the springs may be otherwise varied, and a brace or braces, rope or ropes, chain or chains, may pass from any convenient part of one axle to the other, and from the fore axle to the splinter bar.

[*Printed, 6d. Drawing.*]

A.D. 1805, May 27.—No. 2854.

MILLER, SAMUEL.—“An improvement upon and machinery  
“to be attached to coaches and various other carriages for the  
“better accommodation of passengers.”

One part of this invention relates to a post chaise, and consists in applying a “moveable back” to the seat which may be “set to any angle the passenger may find conducive to his  
“ease, either by a bracket behind or a catch at the side,” or any other suitable fastening. Instead of the back of the seat being moveable the back of the chaise, from the seat upwards, may be arranged to move, pieces of leather attached to the sides of the chaise following the movements of the back, so that no openings are formed in the body of the chaise by such movements. These arrangements are applicable to coaches and other vehicles as well as to chaises, and in the case of a coach may be adapted to either one end of the vehicle or to both ends. Another part of the invention relates to the application of springs, which are connected to the perch of a carriage and meet or nearly so under the body of such carriage, these acting “as counter springs to the fore and hind springs,”  
“to check the irregular motion on rough roads.” In some cases one only of these check springs is used, and such spring may act upon the body of the carriage through the medium of a pad or cushion, or of rollers, castors, or other mechanism.

Another part of the invention relates to the spokes of wheels, and consists in so forming the inner ends of the spokes that they fit close against each other, and do not require to be morticed into a nave, a circular plate of metal or wood being placed at each side of the inner parts of the spokes when laid together, and the whole being thus secured together. These plates are described as being in one case fixed upon a short axle,  
“which, in this case, runs with the wheel.” In another case the plates are connected together by a tube which extends between them, being in this case loose upon the axle, there being grooves in the tube for the reception of the inner ends of the spokes, and the inner plate has a large boss projecting from it having a flange at the end, a “box” being fixed upon the axle and an internal collar carried by the box embracing the boss of the plate, thus keeping the wheel in its place on the axle, and this arrangement being intended also “to secure the

“ body of the carriage in case the axletree should give way.” Another arrangement is set forth in which one of the plates is furnished with divisions for the reception of the inner ends of the spokes, this arrangement being such that a broken spoke may be readily removed and replaced without disturbing the fellow of the wheel.

Another part of the invention relates to “ a machine for “ regulating the fares of figured hackney coaches in the cities “ of London and Westminster.” The nave of one of the hind wheels is so formed as to act as an eccentric, and at each revolution raises one end of a lever, this lever, through the medium of apparatus connected therewith, moves a catch and thereby turns a ratchet wheel forward through the space of one tooth, the lever being depressed after each upward movement by means of a spring. On the axis of this ratchet wheel is a pinion which gives motion to a large toothed wheel carrying a circular plate marked with figures which are successively brought opposite to an opening in a case which encloses the apparatus, the figure which appears at the opening indicating the fare for the distance already travelled. Different modifications of this part of the invention are described, in one case the lever being dispensed with, and the apparatus worked by a toothed wheel connected to the wheel of the carriage, and in another case the apparatus being provided with an additional wheel with figured circle, “ which is to be “ locked up for the private information of the master hackney “ man, shewing the distance his horses have gone through “ during the day.”

[*Printed, 9d. Drawing.*]

A.D. 1805, August 9.— No. 2874.

COLLINS, WILLIAM.—Ventilating carriages and communicating therein. The patentee thus described his invention :—  
“ I take or provide a circular box, made of brass, or any other  
“ proper material, of about an inch in depth, or four or five  
“ inches in diameter, consisting of two rims, one larger than  
“ the other ; the larger one has the bottom to it, the lesser  
“ one I make to turn in the larger one, to which I affix a  
“ pierced or perforated front or tap, which may be done to  
“ any pattern ; to the outer or larger rim I affix two or more

“ tubes of a convenient length, at right angles, as large as the depth of the box will admit of. On the inner rim I make holes corresponding to the size of the tubes, which by turning round are made to close any one or more of the tubes at pleasure. I also make an index on the outside of the pierced or perforated front to shew which of the tubes are closed or which are open, or I make my ventilator without such index, as required. This box or ventilator may be fixed (if for close carriages or sedan chairs) between the lining and the roof, the pierced or perforated front to be visible ; the tubes are then to be extended to the extremity or outside of the carriage or sedan chair. The tube which extends to the back of the carriage where the servant stands will serve to convey any orders that may be given to the servant from the passengers within, but may be closed at pleasure, when the other tubes will be left open for the purpose of letting the warm air escape.”

[*Printed, 3d. No Drawings.*]

A.D. 1805, November 16.—No. 2890.

MILTON, WILLIAM. — “ A mode of rendering carriages in general, but particularly stage coaches, more safe than at present, and various other improvements upon such carriages.”

This invention consists essentially in the application of what the patentee terms “ idle wheels ” below the framing or body of a coach or other vehicle, these “ idle wheels,” which are so termed to distinguish them from the bearing wheels, which the patentee calls “ active wheels,” not being in action during the ordinary working of the vehicle, but being mounted so as to be then a few inches from the ground, and only coming into operation in case of one of the bearing wheels leaving its axle, or an axle itself breaking, in which case the overturning of the vehicle will be prevented, as its descent for a few inches will bring one or more of the “ idle wheels ” into contact with the ground such wheel or wheels then supporting the vehicle.

A mode of applying the invention to a stage coach is described in which a large box is placed below the hinder part of the body of the vehicle for the reception of luggage, the



axle of the hinder bearing wheels passing through this box, and this part of the arrangement itself being set forth as rendering "an overturn much less likely than at present." At each lower corner of this box is an "idle wheel," near to the ground, other idle wheels being carried by framing which projects below the front axle. The opening in the box through which the hinder axle passes may either be furnished with framework and springs, or the axle may be rigidly fixed therein. If there be no luggage box the hinder idle wheels may be carried by framing supported by the hind axle. When a luggage box is used a lever may be mounted below it, and be made to act as a drag when the vehicle is descending a hill. The idle wheels may be variously arranged, according to the particular construction of the vehicle to which they may be applied, and should be so mounted that "they may be vertical " when an accident brings them into work."

[*Printed, 5d. Drawing.*]

A.D. 1806, July 24.—No. 2949.

DE BERENGER, CHARLES RANDOM.—Stuffing carriage seats, &c. This invention relates to the preparation of hog's hair as a substitute for horsehair. After the hair is removed, by scalding and scraping, from the animal, it is treated with lime water and washed. It is then "divided into a cord of about " the thickness of a goose quill, which cord is forced into a " tin, glass, or other tube, while it is twisted." The tube is to be about three-quarters of an inch in diameter. When full, it is closed and immersed in boiling water. "The hair is " then taken out of the tubes and left to cool in solid pieces; " these are afterwards unpicked, when the hair will be quite " curly." The hair is finally dried in pans between layers of hot sand.

[*Printed, 3d. No Drawings.*]

A.D. 1806, October 2.—No. 2971.

COOKE, WILLIAM.—"Certain improvements in the construction of waggons and other carriages which have more than " two wheels."

This invention consists in so arranging the wheels and axles of a waggon or carriage having more than two wheels that

one pair or more of such wheels may be either raised or depressed by coming upon irregularities in the road "without requiring or causing the bed of the carriage, or any appendage belonging or fixed to the same to deviate from the ordinary position of the said bed or appendage," unless such elevation or depression of the wheels shall exceed certain limits. And the invention is carried into effect by "the forming or adaptation or addition of a part or parts of the apparatus at or about the place where the axis of such pair or pairs of wheels shall be connected with the carriage, so that the said part or parts may produce or admit of the effect of an hinge or joint, by which the said axis may be allowed to have either of its ends raised or depressed without affecting the carriage within the limits before mentioned, and so that this effect may take place in all the practicable or convenient angles of obliquity formed between the pole or perch and the said axletree in turning or backing or in any other part of the working of the same."

The patentee states that from "the before-mentioned effects and purposes" of the invention the mechanical arrangements requisite will be "easily deducible" by men of competent skill and experience in works of this kind and nature. He mentions, however, an arrangement in which the upper part of the "main pin" consists of "a knob or piece of a circular figure with respect to the central line or axis of the said main pin (that is to say):—All the sections of the said knob that can be made at right angles to the said axis will be circular, but of a conical or spherical or other bilging figure in its longitudinal section, in order that when the said knobs shall be placed or inserted within an hollow cylinder of the same diameter as that of its greatest circular section the said main pin may be at liberty to move sideways out of the direction of the axis of the said cylinder." This knob is inserted into "a cylindrical hole in the bed of the carriage, or flying pillow, or other fit part or appendage taking care by a nutt or other suitable means to prevent the same from coming out" a connection between the axletree and the rest of the carriage which produces or admits of the effect of a hinge or joint, the pole or perch or other part which may be used to support or steady the lower end of the main pin having a little play to the right and left and the main pin

a slight motion up and down in the holes through which it passes. The "bearing part, which is usually circular, and " called the sweeps or hanging pillow, or spring bed," is made " somewhat prominent " and so as to be " lowest in the " middle, and to admit the face of the lower pillow or axle " bed to shift its place of bearing accordingly as the tilt or " inclination of the axletree is greater or less, and by all " the said contrivances the before-described effect is produced."

In other arrangements the knob may be cylindrical, and the hole in which it works " widening one or both ways from its " smallest perforation ; " or the knob and the hole may each be " bilging or conical in contrary directions ; " or the main pin, or a piece or pieces answering the purpose thereof, may be formed in such manner as not to allow of any side motion or angular change of position in the same with relation to the bed of the carriage, the pole or perch being connected with the same and there being also applied to such pin, or piece or pieces, another piece which shall be capable of moving round against the sweeps or their equivalents. This last-mentioned piece is provided with pivots or gudgeons forming right angles with the main pin or its equivalent, such gudgeons passing into sockets attached to and forming right angles with the axle of that pair of wheels to which it is desired to give play or liberty. Instead of using pivots or gudgeons in the last-mentioned arrangement, an actual hinge or joint, or socket and bearing pieces, may be employed, by which a similar effect may be produced.

[*Printed, 3d. No Drawings.*]

A.D. 1806, November 6.—No. 2986.

VAZIE, ROBERT.—Indicator for vehicles. Part of this invention relates to an indicator for public vehicles, by the use of which it can be shown whether the carriage is for hire or not. The indicator consists of a flap working on a hinge, like that of a knife blade. The flap bears the necessary words, and when the vehicle is unhired, the flap is placed vertically. When the carriage is hired the flap is folded down. In the night time, a lantern with similar but transparent flap or shutter is used.

Another improvement consists in the preparation of a lubricating oil for wheel axles. This oil is made by heating whale blubber by steam, after which the extracted oil is "put into a separate steam pan with water, and is then purified."

The use of this oil in the above-mentioned lamp is recommended.

[*Printed, 5d. No Drawings.*]

A.D. 1806, November 20.—No. 2988.

LLOYD, JOHN WILLIAM.—"Antifriction rollers or wheels, to assist all sorts of carriage wheels."

In this invention, instead of the wheels of a carriage revolving upon fixed axletrees, as customary, the axles are so arranged as to revolve with and bear between antifriction rollers or wheels, which the patentee recommends to be made as nearly one-half the size of the bearing wheels of the carriage as may be convenient. Such antifriction wheels may be composed of suitable metal, or of wood surrounded by metal, and they may be variously arranged according to circumstances, in some cases turning upon fixed pivots mounted in suitable framing, while in other cases the pivots are fixed in the wheels, and turn in suitable sockets. In order to reduce friction the wheels may turn upon pins or gudgeons so arranged that the wheels only bear upon the ends of their naves, and not upon the central parts. Oil may be supplied to the antifriction wheels if desired by means of an oil box suitably arranged, all the details of the invention being fully set forth.

The invention further includes a mode of relieving the wheels of carriages working upon fixed axletrees by causing each wheel and its axis or axletree to turn round together, this being effected by the use of a spring catch, bolt, pin, fork, or wedge, connected with the nave of the wheel, and entering a notch or opening in the axle. By releasing the catch or pin of the wheel from the axle it may be allowed to revolve thereon as usual, and by chaining one of the wheels a "drag" may be produced. Axles made to revolve are described as being provided with collars, and if desirable washers also, these bearing against balls or rollers mounted

in suitable framing, and this arrangement preventing the axles from moving out of their places endwise.

[*Printed, 6d. Drawing.*]

A.D. 1807, March 7.—No. 3020.

HOULDITCH, JOHN.—“Certain improvements in the construction of four-wheeled carriages of different descriptions.”

In this invention the patentee, instead of fixing or connecting the cranes of a crane necked carriage “to or with the sett of wheels in the usual manner,” interposes springs between the axles or framings or other apparatus to which the wheels are usually attached and the cranes, the body of the carriage being secured by means of bolts, screws, keyed pieces, or other suitable mechanism to such cranes, and in such manner that the body may be removed and another substituted for it at pleasure. Two cranes are by preference used (although more may be employed if desirable) such cranes being placed in the longitudinal direction, parallel to each other, or nearly so, and at such a distance asunder that the body may be well and effectually supported by them. In some cases the cranes may each be composed of two pieces and be screwed or otherwise joined to the body of the carriage without being joined together.

The springs of the carriage may be variously constructed and arranged, the patentee stating however, that he prefers to use in his vehicles springs which each consist of “two bows, joined at the ends, and disposed longitudinally, such as have been commonly used and applied in curricles, gigs, and other carriages, under the denomination of grasshopper springs.”

The invention is illustrated by a drawing exhibiting various modifications of the details thereof.

[*Printed, 5d. Drawing.*]

A.D. 1807, April 21.—No. 3034.

DALTON, JAMES FORBES.—“Certain improvements in the construction of four-wheel carriages.”

According to this invention, in constructing a landau, landau barouche, or other four-wheeled carriage, in which

the upper part is to fall before and behind, the roof is to be formed of wood or other proper materials, and separated either into two parts by a division from side to side, or into three (as customary) or more, the patentee stating, however, that he prefers a single division, at about the middle of the roof. The roof and sides are to be sustained by moveable pillars, joints, or other supports, formed of wood, iron, or other proper material, the arrangement being such that on the removal of the supports and the bolts or fastenings at the joint or division, the roof or head will separate, each side turning upon its own pivot, and the pivots being arranged on each side of the door, at about one half the height thereof from the carriage floor, the patentee stating that by this arrangement the parts of the head are freed from the obstructions which are usually placed at the back and front of the carriage body. Different methods of removing the supports may be adopted, but an arrangement is described in which the supports are jointed to the front and back of the carriage body, and so as to turn inwards and downwards, crossing each other and the carriage and ultimately assuming a horizontal position.

In constructing a landaulet the back part of the head is to be arranged according to this invention, but the fore part may be formed "according to the present custom."

[*Printed, 5d. Drawing.*]

A.D. 1807, May 5.—No. 3039.

CABANEL, RUDOLPHE.—"Considerable improvements in the "construction of wheels and axletrees," for which the patentee claims "material advantages."

In this invention an axletree is in the first place composed of two pieces of equal length, there being at the inner end of each piece or half axle a shoulder or cap, the end of which is convex or spherical, and has inserted into it a steel or other metal pin, there being between the caps of the half axles a metallic plate against which the pins bear. These parts are all enclosed within a central axle box, in which are chambers or spaces of suitable dimensions for their reception, these chambers being separated by the metallic plate, which is fixed in the box, the latter being in two parts, which are united,

after the introduction of the ends of the axles and the metallic plate, by means of flanches or otherwise. The chambers are of such size as to leave space around the ends of the axles for a supply of oil or grease, which is introduced into the box through an opening formed for the purpose. This box is firmly secured to the axle bed or other part of the carriage, and the result of the whole of this part of the invention is that two swivel or socket joints are formed which keep the half axles in their places. The naves of the wheels are placed upon the ends of the half axles, each of the latter having upon it a shoulder inside the nave, and against which the latter bears, each half axle working in an axle box, placed near to the shoulder, and secured to the axle bed or some other part of the vehicle, the chamber of this box containing four semi-circular collars which fit the axle, but have between them a chamber for the reception of oil, and the half axle having upon it by preference pegs or pins, or a rim of leather or some other material by which the oil is carried round in the box. The box of the nave differs from those in ordinary use only in being lighter, the nave being shorter than usual, and being secured to and revolving with the half axle by means of screw pins which pass through the nave and its box, the ends of these pins entering recesses in the half axle. In case of an accident happening to a wheel with a short nave, such as mentioned above, and necessitating the substitution for such wheel of a wheel with a longer nave, the end of the axle arm is provided with a projecting screw, upon which an additional piece may be secured, a stay pin passing through both, there being at the end of the additional piece a short octagonal piece, beyond which projects a screw, the octagonal piece receiving a square plate through which is an octagonal hole, a nut being then placed on the screw, and the nut being secured to the plate by screws, the nut being thus prevented from coming loose.

The invention includes various modes of adapting wheels to axles when the bore of the nave is larger than the diameter of the axle, additional rim boxes or collars, melted lead, ferules, collars or boxes with flanching straps, wedges, and other minor apparatus being used in different forms in carrying out these parts of the invention.

[*Printed, 1s. 9d. Drawings.*]

A.D. 1807, July 21.—No. 3063.

BIRCH, CHARLES LUCAS.—“An improvement in the construction of the roofs and upper quarters of landaus, landaulets, barouche-landaus, barouches, barouchets, curricles, and other carriages, the upper parts of which are made to fall down.”

This invention is thus set forth:—“Frame and fix in the top quarter rails to the tops of the standing pillars and slats, and fix the slats to the neck-plates, rabbit the inner parts of the standing pillars, the top quarter rails and the slats, and board them with thin deals or any other proper material. Let the crown pieces or cornice rails be long enough to bevel or mitre into the corners of the top of the standing pillars, and let in the hinges and thimble catches on the top of the crown pieces and top of the quarter rails; fix on the hoop sticks and back and front rails, and board them all up except the two hoop sticks which are nearest to the hinges, which may be placed as close as possible to admit of the head striking conveniently low. Conceal or let in one or more boxed locks to the centre hoop sticks, or at least the hoop sticks which unite the thimble catches, and fix them so as that they may be opened by a key on the inside of the carriage. Stretch strong canvass or other fit material, and nail it or otherwise fasten it, both on the inside and the outside of the slats and elbows, and stuff it between with flocks or tow or other fit material. Likewise stretch and nail on or fasten canvas or any other proper material to the top hook sticks on the roof which are nearest to the hinges, before you put on the leather covering.”

[*Printed, 3d. No Drawings.*]

A.D. 1807, November 6.—No. 3079.

HAWKS, GEORGE.—Cast-iron wheels. Instead of casting wheels complete in one piece, a practice which often results in irregular contraction and consequent cracking of the wheel, they are by this invention to be cast in two or more parts and are then to be joined by bolts, screws, or otherwise.

[*Printed, 5d. Drawing.*]



A.D. 1807, December 9.—No. 3086.

WILLIAMS, JOHN.—“A new mode of covering and enclosing  
“all kinds of carriages.”

According to this invention a carriage cover is formed by the employment of a moveable frame which is “capable of  
“being disposed between grooves or within a cell or space  
“in the body of the carriage, and of being drawn up by one  
“or more straps or webs suitably disposed so as to act nearly  
“in the manner commonly adopted with regard to the glasses  
“or blinds of carriages.” This frame or cover is composed of any suitable materials, and may be furnished with apertures or windows if required. If the material is inflexible the frame or cover is “of such a form or figure as shall be capable of  
“mathematical description about a real or imaginary axis,” being either spherical, spheroidal, cylindrical, or such other figure “as shall in its own nature have reference to an axis.” And such frame or cover may be of any desired magnitude, and so as to cover either a part or the whole of the carriage, stops, pins, or holes in the straps or webs already mentioned, or other suitable contrivances being provided by which the frame or cover may be drawn out of the grooves, spaces, or receptacles to such extent as may be needful, and fixed in the position so obtained. Instead of making the cover of inflexible materials it may be composed of small rods or bars of wood or metal, joined together by tying or sewing, or by glueing them to a cloth, or otherwise. In this case it is not necessary that the grooves or receptacles should have a figure referable to an axis, but leaders or supports should be provided by which the frame or cover can be sustained in any requisite position.

[*Printed, 3d. No Drawings.*]

A.D. 1807, December 19.—No. 3091.

WILLIAMS, JOHN.—Preserving equilibrium, and preventing carriages from overturning.

In this invention, instead of each pair of the wheels of a carriage being mounted upon one inflexible axis, or frame answering the purpose of such an axis, they are mounted upon the ends of levers, each wheel having its own lever, and the levers each passing inwards under the body of the carriage

to the perch, and being connected thereto by a hinge, or joint which answers the purpose of a hinge, "so fixed and applied " that each of the said levers shall be allowed to move in a " vertical circle, or up and down, but not at all sideways." The body of the carriage is supported upon springs of any suitable form, such springs bearing or acting upon or being affixed to the levers, the body of the carriage, when the springs are not so affixed, being connected with the framing beneath by means of an upright bolt or pin which admits of play or movement of the body up and down to the requisite extent. In some cases, besides the ordinary springs, other springs are applied, which support the fore and hind parts of the carriage body, such springs bearing upon the perch or middle bar or framing of the carriage, these springs, however, not being required in four wheeled carriages, although they may be used if desired.

The patentee states that by these arrangements the passing of a wheel over an obstruction in the road will not disturb the equilibrium or cause the same danger of oversetting which would result under the ordinary arrangement.

[*Printed, 3d. No Drawings.*]

A.D. 1808, February 4.—No. 3106.

DUMBELL, JOHN.—Propelling and steering carriages and preventing overturning. A large part of this invention relates to various applications of motive power derived from the action of heated air, gases, steam, &c., upon vanes or fans. This motive power is also shown applied to the propulsion of a carriage, upon which are borne the furnace, air chamber, fan apparatus and bellows. The latter may be furnished with a horn or organ pipe to serve as a warning signal to passengers by the road. The carriage is steered by a hand wheel, working ropes attached to the pole, by which the fore carriage is turned in either direction.

A system of throwing in and out of gear, or clutch for machinery, is also described and its application to carriage wheels and axles pointed out. The wheels may be fixed to the axletree or severally released therefrom, so as to turn independently, as desired.

In order to prevent overturning spheres or portions of

spheres, or similarly shaped bodies, are to be used instead of wheels. The drawing shows a waggon supported on four spheres, each rolling in a frame, which may be fitted with adjustable anti-friction apparatus. The use of a large single sphere, divided into compartments, is suggested instead of the ordinary waggon.

[*Printed, 1s. Drawing.*]

A.D. 1808, September 24.—No. 3169.

PATON, THOMAS.—“Certain new improvements in the construction of wheels for carriages.”

In this invention the stocks or naves of carriage wheels are formed of wrought iron lined with steel, or of bell metal, hard brass, gun metal, or cast iron, with or without a steel lining, or even of cast steel itself. When a wrought iron nave is used spokes of metal have their inner ends inserted into it, and are secured therein by wedging, screwing, keying, or pinning. When a nave of cast metal is used, the spokes may be similarly fixed, or they may have their inner ends laid in the mould in which the nave is to be cast, and the metal be run into the mould around them; in the casting of a cast-iron bush a steel bush may be fixed therein by the same means.

The “filly” or rim upon which the tire is to be fixed is composed of iron or other metal, the “filly” and spokes either being of “one solid piece,” or being connected together by rivets, screws and nuts, or other convenient means. When the wheel is wider than usual two or three rows of spokes may be used, or brackets may pass from a single row of spokes to the edges of the felloes.

Contrivances for keeping the oil in the bushes of wheels are also described, one of these consisting in putting a ring of leather at the back of the nave, a ring being screwed on behind it which projects against the inside of a collar upon the shoulder of the axletree or arm, this arrangement not only preventing the escape of oil from but the access of dirt to the bush. Another arrangement consists in placing a ring of leather upon the outside or front of the collar of the axletree, “to turn in and wear against the nave of the wheel, which will answer the same purpose.”

The invention is illustrated by a drawing in which wheels of different kinds are shown.

[*Printed, 7d. Drawing.*]

A.D. 1809, January 23.—No. 3193.

STRACEY, EDWARD.—“ An improved method of hanging the “ bodies, and of constructing the perches of four-wheeled “ carriages, by which such carriages are rendered less liable “ to be overturned, and of constructing perch bolts and collar “ braces.”

In this invention this perch of the carriage is formed either of tough wood or of metal, and of the usual size, the fore part of the perch being fixed to the transom bed in front in the usual manner, but the after part of the perch, instead of being fixed in the hind axletree bed, as usual, is connected thereto by certain cylindrical boxes of metal in which it is allowed to turn freely or it may work in a box fixed in the hind spring bed. The result of this arrangement is that the fore and hind axles may assume different degrees of inclination from the horizontal line without inconvenience. The same result may be produced by fixing the perch to the hind axletree and allowing the other to turn in the transom bed in front, or by “ making the “ perch revolve on an axis at each end.”

A mode of hanging the body of a carriage upon the springs is described, the main feature of which consists in so forming the body loops that their ends come nearly under the shackles of their respective springs, each end forming an axis on which a shackle for the reception of one of the main braces is placed, such shackle being so jointed to their boxes or sockets as to be capable of working to and fro in the direction of the perch, and the body of the carriage being connected to the braces in the usual manner. The result of this arrangement is that should any of the wheels ascend an obstacle in the road or descend into a hollow so as to cause danger of the vehicle being overturned the body loops will turn on their axes and so preserve the equilibrium of the body sufficiently to prevent such an accident from occurring.

The invention also includes a “ collar brace” which consists of a cylinder or roller mounted on an axis which is supported in standards fixed to the perch or other part to which collar brace

rings are usually connected, certain straps connected to collar brace rings which are attached to the body of the carriage being attached to opposite sides of the cylinder or roller, and the diameter of the latter being adjusted in accordance with the amount of motion which it is desired that the body of the carriage shall have from side to side. If desired, the roller may be connected to the body of the carriage and the brace rings to the perch.

Another part of the invention relates to the perch bolt, which is made shorter than usual, and has about midway of its length a projecting collar, that part of the bolt above the collar being formed into a right hand and the part below the collar into a left hand screw, these screws being each furnished with a flanged nut or threaded socket one of which is sunk into the under part of the transom bed, and the other into the upper part of the fore axletree bed. The patentee states that by this arrangement the fore axletree bed may be turned either to the right or the left with greater ease than would be the case if the common perch bolt was used, the friction between the beds and the wheel plates being almost wholly removed "from their being gradually separated by " the lifting of the screw in the act of turning," the movement of the carriage being also rendered more steady by the transom bed being screwed to the fore axletree bed.

[*Printed, 6d. Drawing.*]

A.D. 1809, September 26.—No. 3266.

FLIGHT, BENJAMIN.—"A new metal nave, axle, and box, for " wheeled carriages, by means of which the danger of over- " turning and the concussion arising from carriages coming " in contact at the nave is considerably lessened," the nave being stronger, while having a lighter appearance than those in general use, the rattling of the carriage being moreover reduced, and the oiling of the wheels facilitated.

In this invention a metallic nave, having mortice holes therein for the reception of the inner ends of the spokes, forms the centre or block of the wheel. The end of the axle is fixed in the centre of the nave, and the axle box, in which the axle works, forms a part of the axletree, and the axle is kept in its place in the box by means of a pair of "chaps" and a bolt which passes through them, these "chaps" consisting in fact,

of two hollow semi-cylinders, provided with internal flanges which enter a groove in the axle. A reservoir for oil is formed in the outer end of the axle, and oil is introduced into this reservoir through a hole in the cap of the nave which is furnished with a screw plug, a passage being formed in the axle which directs a supply of oil from the reservoir to the interior of the axle box.

[*Printed, 5d. Drawing.*]

A.D. 1809, November 2.—No. 3270.

BRAMAH, JOSEPH.—“Certain new improvements in the constructing and making wheels for all kinds of carriages, and also a new method of locking or sledging the wheels of carriages when passing down steep declining hills.”

The object of the first part of this invention is to prevent the destruction of young trees for the purpose of forming the stocks or naves of carriage wheels, this being accomplished by making such stocks or naves of cast iron. And in order to effect a saving of timber in the formation of the spokes and fellies of such wheels the patentee proposes that the parts of such fellies shall not be produced by chopping or sawing a straight piece into a curved form, but by bending pieces of wood into the shape required, while the spokes shall be produced by cutting them out of the tree “by circular saws in longitudinal lines, and in a radial direction, without that loss of wood occasioned by the usual method of splitting them.”

The nave of the wheel is cast with an opening through it for the axletree, and mortices for the reception of the inner ends of the spokes, the mortices being left open in front for the reception of the spokes, and the latter being parallel in their thickness as far as they enter the nave, instead of being of wedge form, and being forced into the nave either by blows or by the action of a powerful press, the arrangement, however, being such that if desired the spokes may be of dovetail form at the inner ends. When placed in the nave the spokes are secured therein by means of a plate or ring, and a nut which is screwed upon the outer end of the nave, a metal cap completing the whole.

That part of the invention which relates to locking or sledging the wheels of carriages consists in the first place in

fixing to the axle of a carriage a round block of wood, the centre of the block not, however, corresponding with the centre of the wheel. Around the block is passed a hoop or ring connected to a lever at one end of which is a hook which embraces the front or leading periphery of the wheel, the arrangement being such that so long as the lever is in a horizontal position the hook is free from the wheel, but is pressed against it with great force should the lever fall into an angular position owing to the movement of the ring or hoop on the excentric block. Various modifications of this part of the invention are set forth, in some cases the lever being retained in position when not required to act by means of a balance weight, while in other cases levers, cords or chains, and other appendages are used in connection with the apparatus, several arrangements being set forth in which sledges are forced under the wheels, instead of the hooked lever being employed.

[*Printed, 8d. Drawing.*]

A.D. 1809, November 6.—No. 3273.

RANDOLPH, DAVID MEADE.—“Certain improvements in the  
“construction of wheel carriages of every description.”

This invention is set forth at some length, and embraces a large number of particulars. A mail or stage coach is described, which is mounted upon four wheels in the usual manner, the body accommodating four inside passengers, and the windows being arranged to “slide back horizontally,” and being furnished with bolts which secure the doors and prevent them from opening when the windows are shut. The specification of the invention is accompanied by several sheets of drawings, but the references to these drawings are so inaccurate and confused that it is difficult to give with certainty the precise particulars of the invention, which embraces various arrangements of spring, stays, and other mechanism, set forth in a variety of forms. The coach already mentioned is provided with a seat in front for the accommodation of the driver and others, and also with seats on the top of the body and behind the latter. A curtain of oiled silk or canvas, or other suitable material, is so arranged at the back of the vehicle, as to serve as an apron for those passengers who sit upon the outer and hinder part of such vehicle, while it will

entirely cover those who occupy a seat which is mounted behind the body and which serves for the accommodation of the guard as well as passengers. One of the main features of the invention appears to consist in causing the front part of the body of a vehicle to be somewhat lower than the hinder part, a line drawn from the front to the hinder part forming an angle of about three degrees with the horizontal line. The object of this part of the invention is not quite clear. The swingletrees, the axles, the perches, and other parts of the carriages are minutely set forth. The wheels may be composed of wood, or of wood and metal combined, one arrangement being described in which a cast-iron nave is combined with wooden spokes and felloes, wedges securing the spokes in the nave. Gigs, curricles, and other vehicles, including carts and waggons, are mentioned as having the invention applied to them, and the invention also includes "a road scraper and earth porter," which is intended "for the several purposes of scraping loose matter," and "removing the loose earth after having been prepared for the purpose by ploughing or digging." The details of this invention will not, however, be at all understood without an inspection of the drawings annexed to the specification. One particular relating to wheels which is set forth as a novelty consists in so forming wheels "that all shall have an unequal number of spokes."

[*Printed, 1s. 2d. Drawings.*]

A.D. 1810, February 12.—No. 3303.

WYKE, GEORGE.—"Certain improvements in the construction of wheel carriages of various descriptions."

This invention relates, firstly, to arrangements by which the body of a carriage may be retained in a vertical position, although the axles and framework may be overturned. An arrangement is described in which the body of the carriage is suspended from the centres of two bars which pass horizontally between the ends of springs rising from the framework, there being two springs before and two behind the body, each pair carrying a bar, and the body being connected to them by braces in such manner as to be capable of swinging freely from side to side. In order, however, to keep the body steady, unless danger should arise of the vehicle being over-



turned, a certain arrangement of collar braces which are attached to the lower part of the body, and certain staples or rings connected to such braces, and which act in combination with hooks and a weight which is suspended from the perch are employed, the result of this part of the arrangement being that so long as the axles and framing remain in a horizontal position, or nearly so, the braces, rings, and hooks retain the body in its vertical situation, while on the framing being thrown into such a position that the vehicle is in danger of being overturned the weight so acts upon one or other of the hooks, through the medium of a quadrant-shaped piece of metal with which it is provided, as to disengage that hook from its ring and brace, and permit the body of the carriage to turn upon its points of suspension and retain its vertical situation. These arrangements are capable of various modifications, several of which are minutely set forth. In one case the body of the carriage is suspended from two springs only, one in front and one behind the body. In another case, instead of the weight for disengaging the braces being in the form of a pendulum, it is composed of a leaden ball placed in a cylinder, and moving to one end or the other of the cylinder as the latter is diverted from the horizontal position, the braces being here released by the ball acting upon a certain bolt and a spring.

Another part of the invention relates to apparatus for locking the hind wheels of a carriage, and consists in the employment of certain locking bolts which are attached to flat plates mounted under the axletree of the wheels, these plates being acted upon when requisite through the medium of certain rods, cranks, and other mechanism which is brought into operation by a pedal pressed by the foot of the driver, the result being that the locking bolts are thrust outwards and between the spokes of the wheels, stopping the rotation of the latter. This apparatus may be arranged to act either upon both wheels simultaneously, or upon one wheel only.

[*Printed, 9d. Drawing.*]

A.D. 1810, February 26.—No. 3311.

LE CAAN, CHARLES.—“ Certain apparatus to be added and  
“ united to the axletrees and wheels or naves of wheels of  
“ carriages, so as to impede, resist, or check their action.”

This invention consists “in causing the wheels, or either  
 “ wheel singly, of any carriage whatsoever to be stopped or  
 “ become stationary at the pleasure of the driver thereof, by  
 “ means of bolts or slides of iron or any other metal or com-  
 “ pound metal, attached to an axletree of any kind or sort,  
 “ which bolt or bolts, slide or slides by means of levers, with  
 “ or without the assistance of springs, come into contact  
 “ with a plate of iron, or any other metal or compound metal,  
 “ on which one or more projections are formed, which plate  
 “ or stop plate, being let in and fixed to the nave of any wheel  
 “ will answer the purpose required by impeding the motion  
 “ of any carriage to the wheel or wheels of which the same  
 “ is applied. The said levers are or may be connected with  
 “ the body of any kind of carriage, and to such part thereof  
 “ as may prove most convenient, by either chains, strings,  
 “ cords, leather, or any other substance necessary for the  
 “ purpose.”

The details of the invention are illustrated by a drawing annexed to the Specification, which details may, however, be varied.

[*Printed, 5d. Drawing.*]

A.D. 1810, May 9.—No. 3336.

BOSWORTH, JOHN.—“An improvement in carriages to  
 “ facilitate the unloading of heavy goods, coals, and other  
 “ things.”

According to this invention, the carriage has by preference four wheels, as being best calculated to aid in carrying out the main feature of the invention, which relates to a mode of forming and fixing the frame or bottom of the carriage. The front wheels may be made so small as to admit of their running under the body of the carriage, for convenience in turning within short distances, or they may be of any size which may seem best adapted to the particular purpose for which the carriage is intended. “The hindermost wheels must be sufficiently high so as to make or leave space enough to contain the load after it is let or dropt down between the wheels. The bottom of the body of the carriage, cart, or waggon is formed of two or more parts which may be called doors or drops, fastened to the sides of the body by hooks, hinges, or any other convenient fastening, and supported by levers or

“ bars which may be fixed or fastened to either of the doors  
“ or drops near or at the centre of the levers or bars, which  
“ with pleasure may be thrown into hooks, catches, &c.,  
“ fastened to the sides of the body of the carriage for that  
“ purpose.” In order to unload the vehicle, the levers or bars  
which sustain the bottom are removed from their fastenings to  
the sides, and the load is then let down either by levers,  
pullies, screws, rollers, “ or tooth and pinion wheels with  
“ rollers,” this being the mode which the patentee prefers,  
and the mode of carrying out which he thus describes :—“ At  
“ the front and hindermost part, or any other convenient part  
“ of the carriage, is a roller or rollers made of wood or iron,  
“ or any other proper metal or material, but I prefer two iron  
“ rollers, one placed before and the other behind the body of  
“ the carriage, which rollers communicate by rope, chain, or  
“ tumbling shaft, and also to the ends of the doors or drops  
“ by ropes or chains which wind round the rollers when  
“ turned, to one or both of which rollers are fixed toothed and  
“ pinion wheels, which are worked by a windlass, by turning  
“ which (the levers or bars being removed) I let down the load  
“ gradually with pleasure. (By letting go the windlass it  
“ will unload itself suddenly, but the former mode I prefer.)  
“ When the load is thus let or dropt down, the two or more  
“ doors or drops will be found, by the pressure of the goods,  
“ near the wheels of the carriage, which will then form a sort  
“ of box or space which will contain the loading, and which  
“ box or space should be as large or larger than the dimen-  
“ sion of the body of the carriage which previously contained  
“ it. I then draw the carriage on until clear of the load let  
“ or dropt down, then I turn the windlass the contrary way  
“ to that of letting or dropping down the load, and the doors  
“ or drops are raised and replaced in their former situation ;  
“ then I pull the levers or bars at the bottom of the carriage  
“ into their fastenings, and the whole is compleated. A break  
“ such as is used in windmills, or in many other works, may  
“ be used to advantage in very heavy loading, to prevent its  
“ going down too rapidly.”

[*Printed, 3d. No Drawings.*]

A.D. 1810, June 8.—No. 3344.

WILLIAMS, JOHN.—“Certain apparatus or additional parts  
“to be applied to and used with wheel carriages, in order to  
“render the same more safe and commodious.”

This invention consists essentially of a certain apparatus called a “preserver,” the object of which is to prevent a carriage from tilting or overturning in case of the horse falling, or any part of the vehicle giving way. According to one modification of the invention, the preserver consists of two arms curving outwards and downwards from a socket, which by means of a clip plate, a spindle, and other minor details, may be connected to the axle of the carriage. The arms or branches curve downwards until within a short distance from the ground, the ends being then turned upwards, and the front arm or branch being by preference made longer than the other. In case of any accident occurring which might tend to tilt or overturn the vehicle, these arms or branches come down upon the ground and preserve the vehicle from being either overturned or dangerously tilted. This arrangement applies more particularly to vehicles with two wheels, but in the case of vehicles with four wheels one such preserver passes down from that part of each axle inside the wheel, and the lower parts of the branches of each preserver are braced together and covered with some material which causes them, when they come to the ground, to act as a sledge.

[*Printed, 6d. Drawing.*]

A.D. 1810, September 17.—No. 3378.

VARTY, JONATHAN.—“Certain improvements in the axletree  
“of carriages.”

The patentee sets forth this invention as follows:—“In  
“making the arm of the axletree I divide the bottom half of  
“the axletree into several parts, according to the weight  
“intended to be carried. I then cut out of the two upper  
“thirds, supposing the under half to be divided into three  
“parts, sufficient to take the bearing of those parts, so that  
“the friction and weight rest only on the sixth part of the  
“axletree; the bearing part I leave larger or smaller agree-  
“ably to the weight intended to be carried. In some cases I  
“fix small rollers, two or more, as occasion may require, in

“ recesses cut for that purpose in the bottom of the axletree.  
“ These rollers turn on their own axes in pieces of steel or  
“ any other hard metal also fixed in the said recesses. In  
“ this case the bottom of the axletree must be flattened in  
“ order to throw the weight on the rollers. I then make a  
“ groove the length of the arm on the top side, with small  
“ holes through the axletree to admit of oil flowing through  
“ to supply the axes of the rollers with sufficient moisture.  
“ In this case the box or bush must be made with a cap at  
“ the point or shoulder, or with caps both at the point and  
“ shoulder, to contain oil, as is frequently practised on different  
“ principles ; or I supply the axletree with oil through a pipe  
“ introduced through the shoulder waster, at the upper end  
“ of which pipe I screw a can, cap, or hollow ball to contain  
“ oil. These several improvements may be used either separately or collectively. In cases where the box or bush is  
“ a fixture, instead of cutting away the axletree I make the  
“ alteration in the bottom half of the box in the same way as  
“ described for the axletree. When horizontal axletrees are  
“ used, the arm of the axletree should be of the same size at  
“ the point as at the shoulder, and the wheel made perfectly  
“ upright without any dish.”

[*Printed, 3d. No Drawings.*]

A.D. 1810, October 15.—No. 3396.

WHEATLEY, JOHN.—“ An improved axletree for wheels of  
“ carriages, and also improved wrought or cast iron boxes and  
“ cast-iron hocks to receive the spokes of the wheels.”

The specification of this invention consists merely of a drawing containing certain figures which are accompanied by references. An axletree is represented, in which a cylindrical arm projects from each end of a central piece or bed, there being at the inner end of each arm a collar, which is meant to retain the box of the wheel in its place upon the arm, a cap being screwed to the inner end of the box which embraces such collar, a washer of steel between two washers of leather, being, however, interposed between the back of the collar and the inner end of the cap, the object of these washers apparently being to prevent the escape of oil from the box, which is provided in its interior with a reservoir for such oil, the arm of the axle being grooved to assist in the lubrication of the

parts. According to one figure the outer end of the box is closed by a cap which is screwed upon it, although in another figure a box is shown as having the end closed in casting, or otherwise forming the box. From this figure it would appear also that the inner ends of the spokes are secured into the recesses formed for them in the box by pins passing through them, and also through a projecting ridge in which the recesses are formed, but this part of the invention is not very clearly set forth.

[*Printed, 6d. Drawing.*]

A.D. 1811, March 9.—No. 3410.

COLLIDGE, JOHN.—“Certain improvements in and upon  
“carriages and other wheel boxes and axletrees.”

In this invention an axletree is formed by preference of wrought iron, case hardened, the arm of the axle being cylindrical for the greater portion of its length, but having at the outer end a short portion of much smaller size than the rest. The axle box is formed by preference of cast iron, case hardened, but may be composed of brass or other metal, and is made to fit the arm of the axle, a “bridge” or projection in the interior of the box coming against the shoulder which is formed where the larger joins the smaller part of the arm, and there being placed upon the small projecting part of the arm, beyond the bridge, a ring or collet, there being beyond this, again, a linch pin, which may be composed of one part, or of several pieces suitably united, there being through the head of this pin, however, a hole through which a pendant ring is passed, such ring hanging over and embracing the small part at the end of the arm, and effectually preventing the linch pin from rising out of its place. To the outer end of the box a cap may be screwed or otherwise attached, such cap forming a reservoir for oil, which may be introduced thereto through an opening furnished with a screw plug, the oil passing thence into certain cavities by which the bridge and ring are lubricated, a supply of such oil, moreover, passing along the arm of the axle and into a reservoir formed in the inner end of the box, a metal cap fixed upon the bed of the axle covering that end of the box, and preventing the access of dirt thereto, a certain groove or cavity formed in the

box, and corresponding with a similar groove in the arm of the axle, aiding in the same object, which may be further facilitated by the use of a leather washer. If it should be thought that a reservoir for oil at the outer end of the box is unnecessary the cap at that end may be dispensed with, and a common linch pin may be used instead of that mentioned above; or screw nuts may be used, either with or without a linch pin, the main feature of the invention being the bridge mentioned above. That part of the projection at the end of the axle upon which the ring is placed is slightly flattened, the ring fitting thereon, and being thus prevented from turning round.

[*Printed, 5d. Drawing.*]

A.D. 1811, March 14.—No. 3413.

COOPER, THOMAS WILLIS. — “A certain apparatus to be fixed on the naves of wheels and beds of axletrees of carriages, so as to prevent accidents from the axletrees breaking,” or the linch pins or cap screws getting out of their places.

According to this invention there are fixed to the carriage or to the beds of the axletrees, and secured in their places by bolts and clips, straps of metal projecting forward over the naves of the wheels, there being also secured to the axletrees, or their beds, other straps which project below the naves. The latter have also affixed to them grooved flanged hoops, or the boxes of the wheels may have flanges upon them to form the grooves, and “joint hoops” are connected to the straps under the naves of the wheels, and pass loosely upwards between the flanges of the grooved hoops or of the boxes of the wheels, the joints being connected to the lower straps, and the upper parts of the hoops being secured to the straps above the naves, covers being applied to the hoops to prevent the access of dirt to the parts. The result of this arrangement is that should an axletree break the body of the carriage is supported by the naves of the wheels through the medium of the straps and the joint hoops and flanged and grooved hoops, or grooves in the boxes of the wheels, while in case of a linch pin or wheel cap becoming displaced the wheel is by the action of the same parts prevented from

leaving the axle. Instead of the arrangement described above the naves of the wheels may be provided with hoops of metal, having three or more "necked studs" on each hoop, there being fixed to the tops or bottoms or sides of the axletrees, or their beds, straps of metal formed at the ends next the naves as hoops round the axletrees or beds of such, the hoops on the naves having connected to them internal flanch hoops with mortices in them to receive the necked stubs, the internal flanch hoops projecting backwards from the naves of the wheels and covering the hoops of the straps on the axletrees or beds of axletrees, and working around them. In case of the breaking of an axle, or the displacement of a linch pin or wheel cap this apparatus will produce the same effect as that already set forth.

[*Printed, 3d. No Drawings.*]

A.D. 1811, March 26.—No. 3421.

CRAIGIE, JOHN.—"Certain means and improvements on "waggons, carts, and other wheel carriages, whereby friction may be saved, labour facilitated, and a greater degree of safety obtained."

The "principle" of this invention consists in "making the load a live instead of a dead weight." Instead of the load being placed in a vessel, receptacle, or carriage body mounted upon rigid framing, a moveable framing is formed for its reception, this framing being suspended by means of braces from longitudinal side pieces mounted upon suitable axes, and the latter being provided with wheels in the usual manner. By this arrangement the braces "will give temporary way on any impediment to the motion of the carriage, and thereby operate in the nature of a spring, while the centre of gravity moving forwards there will be a propelling power in the load." Moreover, the effect of the arrangement will be that in ascending or descending a hill the centre of gravity of the load will remain the same, instead of, as in ordinary vehicles, being thrown backwards in the first case, and forward in the second. Stays may be connected to the upper part of the body of the carriage, "in order to keep it steady and prevent rocking in uneven roads."

[*Printed, 3d. No Drawings.*]



A.D. 1811, April 10.—No. 3431.

BLINKINSOP, JOHN.—Propelling carriages. This invention relates to the construction of a rail or tramway upon which a carriage having a toothed or studded wheel is to run. It also relates to the driving of such carriages by means, preferably, of steam power carried with the vehicle and acting through a crank directly on the axle, or through gearing.

The invention also consists in moving other carriages by attaching them to that upon which the engine is placed.

[*Printed, 3d. No Drawings.*]

A.D. 1811, April 11.—No. 3432.

TAYLOR, JOHN.—“Certain improvements in the construction of wheels for carriages of different descriptions.”

This invention consists in the first place of an apparatus which is applicable to the wheels of carriages, and so constructed as to facilitate and render secure the fastening of the box into the stock of the wheel, and the wheel on the axletree, and to loosen or tighten the wheel on the axletree as circumstances or convenience may require, to reduce friction and prevent “stickage,” arrangements being also made for supplying the apparatus with oil without taking off the wheel from the axletree, and in such a proportion or quantity as to render a supply necessary not more than once or twice in a year. The apparatus consists in the first instance of a wheel box formed of suitable metal, and of some length, being adapted for the reception of an axle arm which may either be cylindrical or conical in figure, the outer end of the box being solid, and having thereon a screw thread, an inverted point being added if required, “for the purpose of being fastened into the stock by means of a nut.” The inner portion of the box is much larger in diameter than the rest, and has inside it a screw thread for the reception of certain half nuts and a collar on the inner portion of the arm, these half nuts serving to retain the arm in the box, certain clickers, or stops, or pins in the half nuts being arranged for the purpose of loosening or tightening the wheel on the axle as required. In the large part of the box is a hole through which oil may be poured into the box, and a bead is formed

on the arm in addition to the flanch already mentioned, such bead superseding the necessity for a linch pin. The half nuts run upon a part of the arm behind the flanch, which is adapted for their reception, and this part of the arm is lubricated, as well as the other parts, by the passage of oil from a reservoir formed in the arm itself, through certain holes and along certain grooves arranged for the purpose, this reservoir being supplied through the hole in the box mentioned above.

The invention also includes a spanner, for slackening and tightening the half nuts, for conveying oil into the box of the wheel, and for cleaning out the reservoir in the arm, this spanner being composed of three essential parts, adapted to these three objects. A spring is so arranged that when the half nuts are inserted into their places they are prevented from leaving such places by such spring.

[*Printed, 5d. Drawing.*]

A.D. 1811, May 1.—No. 3440.

THOMPSON, GEORGE ALEXANDER.—“Some machinery for “dragging, locking, and scooting the wheels of carriages.”

In this invention an “iron strop” is fixed around the bed of the axletree of the hind wheels of a carriage, the upper part of the strop being formed into a shoulder, and the latter inclining inwards, or from the wheel. To this shoulder is connected, by a pin, or screw and nut, or any other suitable contrivance, a locking bar, such locking bar being “a little “bent outwards” from the pin or fulcrum on which it works, and being so bent at the end as, when required, partially to embrace the rim of one of the wheels. At rather less than half the length of the bar from the fulcrum is a swivel hook or eye, to which is attached a cord or chain, the latter proceeding thence either to the seat of the guard or to that of the driver of the vehicle, and being furnished at the end with a handle, and a loop which, being placed upon an eye bolt or stud will retain the apparatus in any requisite position until required to act, the arrangement being such that by slackening the cord in one direction the locking bar is made to act upon the front part of the wheel, and so to check the onward progress of the carriage, while by again drawing up the cord and then slackening it in another direction the bar may be

turned over and made to act upon the back part of the wheel, in which position it will counteract any tendency the carriage may have to run backwards when ascending a hill. The locking bar may, if desired, carry a shoe or "scoat pan," which by the lowering of the bar may be made to pass between the wheel and the ground.

[*Printed, 6d. Drawing.*]

A.D. 1811, August 7.—No. 3474.

\* BROWN, HOUSTOWN RIGG.—"Certain improvements in the  
" construction of wheel carriages, wheels, axles and boxes."

This invention relates in the first place to "the simplification of the construction of wheel carriages of every description by the adoption of metal in the construction of the perch, the wheels, and other parts thereof" which have hitherto been made of wood only, or wood strengthened with iron, such wheels being thus rendered both stronger and lighter than those in ordinary use. Another part of the invention relates to axles, and is calculated to render the fastenings of the wheels much more secure, "by removing them from the outer end of the axletree where it is weakest and most liable to an accident, to what is called the inhead, where the axletree is strongest and less exposed to injury;" the invention further comprehending "a new and easy method of oiling the wheels, and at the same time of securing by a close ended brush a supply of oil sufficient for the longest journey."

The perch of the carriage is composed of wrought iron, steel, or other fit metal, and may either consist of one piece, or of several pieces, which latter may be either put together by themselves, or have interposed between them cloth, leather, felt, or some other similar substance, such pieces being connected together by means of screwed hasps, hoops, rivets, or other fastenings. A perch may be thus constructed the outside bars of which may diverge sufficiently from the centre to become the support of the spring stays, a transome bar, and a hind axletree bed, with their respective mountings. The latter may be composed of wood, or of wrought iron, steel, or other metal. The under carriage may be composed of wrought iron, steel, or other metal, as also the spokes of the

wheels and sometimes the felloes, the invention being set forth as consisting in "the use of iron, steel, or other metal, " to the total exclusion of wood, in one or more or all the " principal parts of a carriage, properly so called, and " wheels." In the construction of wheels of metal the nave may be of cast iron, brass, wrought iron, or other metal, in one solid piece, or in two pieces, and be made to answer both as a nave and a brush, or it may be provided with a separate brush, fitted into its centre by ordinary means. In fixing the spokes various methods may be employed. They may either be soldered into the nave, or driven into the latter, or be furnished with shoulders and fastened by means of hoops and wedges. The axles may be composed of ordinary materials, and are by preference made "perfectly cylindrical, without " any screw at the end or outhead," each arm of the axles being formed "with the inhead, washer, or collar in the solid " of the pin, about two and a quarter or two and a half inches, " more or less, according to the strength of the axletree, " larger in diameter than the pin," there being another collar, smaller than that already mentioned, formed nearer to the point or end of the arm of the axle, a collet working between these collars, such collet being contained within the bush of the wheel, and preventing the wheel from leaving its place on the axle arm. At the back of the largest collar is a "dust hoop," the bush at the outhead being "solid or close, " and made a little longer than the pin of the axletree, by "which means there is a vacuity when the bush is put on, " which, being filled with oil, supplies the necessary waste." The pin of the axletree is formed into "a hollow cylinder up " to the shoulder," and oil is admitted thereto "by a hole " made in the shoulder of the axletree on the inside of the " largest collar, and fitted with a screw," such oil being poured into the hole after the removal of the screw, and finding its way down the centre of the pin, "and when a " fresh supply is wanted there is no occasion to take off the " wheel or use letters to turn up a particular part of it." Other modes of oiling these axles may be adopted. In using these axletrees with wheels of which the spokes consist of metal the nave may either be bushed or otherwise. In the case of a common wooden wheel with a wooden nave the

patentee occasionally cuts a groove "at the out end on the " outside of the bush," a circular plate of iron, made in two halves, being placed in such groove, and then made fast to the nave as a further security, "in addition to the common " wedging up of the bush."

[*Printed, 4d. No Drawings.*]

A.D. 1811, August 7.—No. 3475.

TAYLOR, WILLIAM.—"A certain machine or apparatus to be " attached to the axletree and nave of wheel carriages, " whereby their motion may be gradually checked and " stopped, and also again loosened or unstopped at the plea- " sure of the driver or passengers, during the progress of the " carriage."

According to one part of this invention a brake is composed of two bent pieces of metal, mounted upon a fulcrum on one side of the nave of the carriage wheel, and one piece extending over while the other piece extends under the nave, in such manner that when brought towards the nave they almost entirely surround it. When this apparatus is required to act the two pieces are brought together by a screw which passes through their ends, such screw being either a common screw with a shoulder, or a right and left hand screw, the shaft of this screw extending upwards, and being connected by means of a " compound joint " to a rod at the upper end of which is a handle, by turning which the brake may be brought into and taken out of action at pleasure. The object of the joint is to allow the rod to move in accordance with the oscillations of the carriage, the screw being " fixed and not elastic."

In another arrangement the carriage wheel has affixed to the spokes a ring or small wheel around which is loosely passed a spring hoop, one end of which is connected to an arm fixed to the axletree, while the other end is connected to a lever which extends upwards, and by moving which the hoop may be tightened around the ring or small wheel and so act as a brake.

In another arrangement an oval hoop is placed around the nave of the wheel, this hoop being supported in suitable bearings, and, when required to act as a brake, being drawn

upwards by a screw so as to press the inside of the lower part of the hoop against the nave, this screw being worked by a rod and winch, as in the first arrangement, a sliding and a socket joint here enabling the rod to oscillate with the motion of the body of the carriage without affecting the screw and hoop.

[*Printed, 6d. Drawing.*]

A.D. 1811, September 14.—No. 3490.

SILVESTER, EDWARD.—“A new drag or skid to be applied  
“to the wheels of carriages of different descriptions.”

This skid consists in the first place of two parallel arms or sides, suitably connected together, and having jointed to them at one end an iron pan which is meant to pass under the wheel when the apparatus is used, the sides curving upwards from that part towards the middle and then again curving downwards, and being provided at the other end with a small wheel mounted in a swivel, this wheel serving to sustain that end of the apparatus by resting on the road. Near the pan the sides are provided with certain jaws, and a catch by which the apparatus may be secured to the felloe of the wheel when it becomes necessary to apply the skid other jaws embracing the sides of the felloe, and the catch, when applied, being secured in its place by a spring. The pan, as already mentioned, is jointed to the sides or arms, and in order to prevent it from falling out of position it is bent upwards at the inner end, the bent part bearing against the lower parts of the sides.

This skid is “equally applicable to two-wheel carriages as  
“to those having more wheels than two, without bringing the  
“weight upon the horse when the wheel is skidded.”

[*Printed, 5d. Drawing.*]

A.D. 1812, January 13.—No. 3514.

NICHOLSON, WILLIAM.—“Certain improvements in the  
“method or manner of supporting or suspending the bodies  
“or principal parts of wheel carriages.”

[*No Specification enrolled.*]

A.D. 1812, January 20.—No. 3520.

WHITE, GEORGE.—“ A new or improved method of preventing accidents from carriages.”

This invention relates to improvements upon an invention for which a patent was granted to John Williams, dated the 8th of June 1810, No. 3344, and which consisted in the application of certain “ preservers ” to wheeled carriages, such preservers, according to the present invention, being constructed “ so as “ to be capable of being raised or folded up, instead of being “ kept constantly in one situation,” for which reason the patentee of the present invention denominates them “ invisible “ preservers.”

The details of the invention may be varied, but an arrangement is described in which the “ preservers ” are fixed to the “ scrole irons of the springs, or if there be no scrole irons, “ then to the understay heads, or other fit and convenient “ part or parts of the carriage,” each preserver being provided with a spring which gives it a tendency to assume “ the “ downright position when at liberty to do so, and also with a “ rack or ratchet and catch to prevent it from returning “ unless allowed by discharging the said catch.” As set forth, the invention embraces a large number of pins, collars, bars, levers, and other mechanism, the combination of which will only be understood with the aid of the drawing annexed to the specification, the “ preservers ” not only serving to set free the horse or horses from the vehicle when desirable, but having also combined with them a “ ladder ” which will support the shafts or pole of the carriage after the disengagement of the horse or horses therefrom.

[*Printed, 6d. Drawing.*]

A.D. 1812, February 6.—No. 3536.

PALMER, WILLIAM.—Using rollers instead of wheels. These improvements relate to various applications of rollers in lieu of wheels. The rollers may extend from side to side, the whole width of the carriage, or they may be short and fitted in sets on each side of the vehicle they support. Each set of rollers, of either kind, supports a block or sledge fixed to the carriage. This block, which may be of wood or iron or both,

presents a plane surface underneath and a curved top. The rollers in each set are linked together by chains or bars and as the vehicle progresses the rollers, after the block has passed over them, are picked up and pass over the block from the rear to the front and are deposited again on the ground for the block to pass over. Guides are fitted to the block to keep the rollers in place, and the block is made hollow at the top so that dirt may fall off the rollers and be led away, by inclined planes. The rollers may be of wood or iron or both. The front sets may be made smaller to allow of their locking under the vehicle in turning. The shape of the block may be varied to suit the requirements of the traffic and carriage.

One form of truck or carriage is shown, in which rollers pass from the rear completely over it to the front. This truck is very low and is intended for the carriage of heavy bodies, which may then be more easily loaded.

[*Printed, 7d. Drawing.*]

A.D. 1812, July 28.—No. 3589.

BELLINGHAM, JOHN. — “ Certain improvements in the “ make and construction of axletrees for all descriptions of “ carriages.”

In this invention the arm of the axle is conical in form, but fixed in such a position that the lower side of the arm is horizontal. About midway of the arm is a broad groove, a passage in the arm leading from this groove to a reservoir formed in the shoulder of the arm, this reservoir being provided at the top with a valve, which may be lifted when a supply of oil is required in the reservoir, but which is kept closed at other times by a chain connected to a spiral spring. At the outer end of the arm is a screw thread for the reception of a nut, having a collar thereon by which the wheel is kept in its place upon the arm, this nut, as well as the screwed end of the arm, being slotted for the reception of a spring linch pin. The axle box is plain in the interior, and corresponds in form with the conical part of the arm, excepting that it is not grooved, the exterior being furnished with a screw thread by which it is secured in the nave of the wheel.

[*Printed, 8d. Drawing.*]



A.D. 1812, November 26.—No. 3616.

BRAMAH, JOSEPH. — “ Certain improvements in the construction of various parts of wheeled carriages, one of which improvements is applicable to other machinery where a rotary motion is necessary.”

According to the first part of this invention each wheel of a carriage has its own axle, and is fastened thereon in the manner in which a “ chuck ” is connected to the mandril of a common lathe, the axle revolving therewith, and working in “ double bearings,” and being adjustable by a back centre screw in the same manner as a mandril. The “ double bearings ” consist of a front and a back bearing which are united together by means of an oil-tight cylinder, the internal diameter of which is larger than the diameter of that part of the axle which is within it, the cylinder being supplied with oil from an outside feeder, and the axle thus constantly running in oil. A modification of this part of the invention is described in which the wheels are both placed on the arms of one axle, the latter running in oil as mentioned above, the wheels being sufficiently tight upon the axle arms to revolve therewith under ordinary circumstances, but being capable of “ moving stiffly ” thereon “ when the stress of a sudden turn is felt,” this arrangement being more especially applicable to two wheeled vehicles.

Another part of the invention relates to improvements upon a former invention of the present patentee, and has reference to the construction of wheels. The rim consists of two flat rings of iron, placed outside felloes of wood, the rings forming the sides of the rim, and the spokes being shouldered, the shoulder of each spoke coming under the rings, and the heads of the spokes fitting tightly between the felloes, the whole being secured together by rivets. The fibres of the wood composing the felloes may, if desired, be arranged radially, and such a wheel may either be used without any tire or outer covering, or may be surrounded with leather, the wheel in either case running “ mute.”

Another part of the invention relates to the application of pneumatic springs for carriages, the patentee stating that the details of this part of the invention may be varied, but that “ the most obvious method ” and that which he purposes in

most instances to adopt, "is, the simple cylinder and piston " connected with an air vessel" from which the cylinder is supplied with condensed air. He states, however, that he does not confine himself to any "precise apparatus," but rests his claim to novelty upon the "principle of employing air to useful " purposes instead of steel or other metal."

[*Printed, 11d. Drawing.*]

A.D. 1812, November 28.—No. 3618.

ROGERS, THOMAS.—**Wheels.** The spokes are first made of wrought iron in any convenient shape. Their outer ends are suitably prepared to receive a cast rim. This rim is cast with or without a central or inner ring of malleable iron, which may be attached to the spokes, and may be shod as are ordinary wooden wheels. As soon as the rim is cast and cold, the nave is cast round the inner ends of the spokes. This may be cast solid, or hollow with an oil cavity. It is completed by boring and turning or otherwise.

[*Printed, 3d. No Drawings.*]

A.D. 1812, December 19.—No. 3627.

HEFFER, GEORGE.—"An improvement in the construction " of four-wheel carriages."

This invention consists mainly in the employment of a curved "brace" which passes from the front to the hind axle-tree, bolts connected to the ends of the brace passing through the axletrees, about midway of their length, and moving up and down by the play of the carriage springs, or the ends of the brace clasping and moving up and down upon bolts connected to the axletrees.

The brace is curved so as somewhat to resemble in form the letter S, and is connected about midway of its length to the bottom of the carriage body. The bolts are covered by ornamental worm springs, which work in unison with the ordinary bearing springs of the carriage, there being inside these worm springs certain short leather pipes, one capable of working up and down within another, and these pipes, along with certain metal plates, serving to prevent the access of dirt to the holes in the axletrees through which the bolts pass. An iron stay is fixed to the bolt which passes through the front axletree

below the brace, “to prevent the pole from swagging,” there being a joint in this bolt between the wheel plates, to prevent any “twist” on the carriage when the front wheels pass over uneven ground, that part of the bolt which is within the transum being square, “to turn it as the carriage locks.” There is also a joint in the hind bolt, “as near the head as possible, “to admit either of the hind springs to play separately as well “as both together.”

[*Printed, 5d. Drawing.*]

A.D. 1812, December 30.—No. 3632.

CHAPMAN, WILLIAM, and CHAPMAN, EDWARD WALTON.—Working carriages by ropes, &c. This invention relates to a system of propulsion by means of a fixed rope, passing round a rotating drum on the carriage. The invention is described as chiefly applicable to railways, but its use on common roads is also claimed. The rope or chain, which is fixed at each end of its length, passes round a drum or pulley, worked by machinery from the carriage. On each side of the drum or pulley is another pulley, attached to a lever, in such a way that by putting a weight over from one side to another, either pulley may press on the chain or rope and keep it in proper friction contact with the drum or pulley. At intervals in the road small upright **V** pieces are planted. These serve to hold the chain or rope and to preserve a sufficient length thereof tight, without the necessity for tightening up the whole.

A system of tramway and common road upon which such a rope could be laid is described.

The invention also relates to a method of supporting carriages on a bogie, for the purpose of facilitating easy turning of curves.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1813, March 13.—No. 3665.

KITTOE, ROBINSON.—“A double-coned revolving axle for “carriages.”

This invention consists in making axles for carriages “which “turn on their iron bearings at the same time that the wheel “turns on the arms, and in otherwise reducing the friction

“ by means of conical bearings on the outer and inner ends of the arms.”

The axle is perfectly straight, “ having both arms and bearings turned on the same centers.” The axle box is “ chambered ” for the reception of oil. At the outer end of each arm is a conical bearing, which is prevented from turning by means of a groove in the cone and a feather on the arm, or by a steady-pin in a washer which, along with a nut, is employed to prevent longitudinal movement of the axle in the box, the whole being enclosed by a cap which is screwed upon the outer end of the box, and prevents the escape of oil from the latter. The axle itself works in a bearing which consists of a brass gudgeon secured by bolts within a pedestal or bed, such bolts also serving to connect the bearing to a spring or stay iron, a hole furnished with a screw plug serving to admit oil to the bearing when necessary. As already intimated the axle arms are conical at both the inner and outer ends, this part of the arrangement aiding in keeping the wheel box steady, as well as reducing the amount of friction which would otherwise be created.

[*Printed, 6d. Drawing.*]

A.D. 1813, May 22.—No. 3700.

BRUNTON, WILLIAM.—Propelling carriages. Upon the carriage there is fitted a steam or other engine, which by means of a series of levers, acts upon two or more props or legs fitted with feet, in such a manner that the latter by pressing against the ground after the manner of “ the motion of a man’s legs “ in walking ” pushes or propels the carriage. The feet are fitted to the legs or props by means of such joints as will enable them readily to conform to the nature of the ground.

The invention is also described as applicable to railway and tramway purposes, and may operate through racks or ropes or otherwise.

[*Printed, 7d. Drawing.*]

A.D. 1813, June 29.—No. 3713.

WILKS, CHARLES. — “ Certain improvements on naves of “ wheels for carriages, and for centres of wheels for machinery for various purposes.”

In this invention the nave of a carriage or other wheel is in the first place formed of wood or metal, there being recesses formed in one side of the nave for the reception of the inner ends of the spokes, these being then secured in their places by a collar of metal or other material which is connected to the nave by bolts or screws. The recesses for the reception of the spokes are wider at the outer than at the inner ends, "which gives what workmen call a good drift for tightening the spokes on the flat sides," this being performed (by preference) by drawing the collar tightly against the spokes by means of six long temporary bolts, which are afterwards removed one by one and others substituted for them. The spokes may also be of dovetail form at the inner ends, so as to prevent them from being drawn out of the nave, and be bevilled in accordance with the amount of dish or splay required in them, the collars being of forms adapted thereto.

The patentee recommends that in naves of wheels for mail coaches or gentlemen's carriages, where neatness is requisite, a circular moulding be cast round the inner end of the nave, "in which moulding the heads of the bolts may be counter-sunk and turned in by the head" a similar moulding being cast on the outside of the collar, "and a female screw cut through on that part, by which method the bolts will not be visible,"

[*Printed, 5d. Drawing.*]

A.D. 1813, August 25.—No. 3733.

HANCOCK, JOHN.—"Improvement in the construction of carriages, and in the application of a material hitherto unused in the construction thereof."

The "hitherto unused" material is whalebone, which the patentee applies "partially or more particularly." The circumferences of the wheels are formed of ash or other timber, and are bound with iron. The spokes are of whalebone, "fastened into by mortice and tennon, or by passing the tennon quite through the mortice, divided as tho' for wedging, and turning each half contrarywise down upon the wood on the outside, and nailing or otherwise fastening it. The nave or box is of cast brass or other metal. The axle is iron,

“ and has a collar on it, in the centre of which a groove is  
“ turned. This collar just enters the back part of the box,  
“ on the outside of which a groove is turned,” with a mortice  
through on each side exactly opposite to the groove in the axle.  
Round the groove in the box two springs are fastened, with  
a bolt or catch formed on the end of each, something resembling  
those in a common door lock. These bolts go through the  
mortice in the box into the groove in the collar on the axle,  
and are kept down into this groove by the springs. On the out-  
side of the bolts is made a hoop with which to pull them up when  
the wheel is to be taken off. About half way across is turned  
another groove, wide enough to admit the spokes, across  
which groove pieces of iron are let in, under “ which the  
“ spokes are passed, so that one piece of bone forms the two  
“ spokes. An iron collar is then put on each side of them  
“ upon the box, which fastens the ends of all the iron cross  
“ pieces, and thus these fix the spokes in the box. When  
“ the spokes are thus fixed into the wood or circumference  
“ and into the boxes each two of them that are formed of  
“ one piece of bone are then braced together as tight as  
“ possible, in the manner drums are strained, only with  
“ iron clips and rivets. The wheels are pushed on the axle,  
“ and are fastened by the springs pressing the bolts into the  
“ groove in the axle, as before described. The carriage is  
“ made much in the same manner they are generally, only  
“ in gigs a piece of whalebone is put between the iron under  
“ the shafts to prevent their breaking, and whalebone is  
“ otherwise introduced to strengthen or brace the carriage,  
“ as may appear necessary in the different forms or on which  
“ they may be constructed. The springs are made of steel,  
“ with bone round, under, or upon them, to prevent their  
“ breaking, or of whalebone entirely, their form also depend-  
“ ing on the different construction of the carriages. The  
“ body has no other novelty than the occasional introduction  
“ of whalebone, their form depending upon individual fancy  
“ or convenience, or the variation of public taste. The  
“ heads, hoods, or roofs are composed of cotton, silk or  
“ leather, with whalebone, iron, steel, cane, or wood, to  
“ strain or raise them, constructed much in the usual way,  
“ but subject, like the bodies, to different methods to make

“ them lighter or stronger, &c.,” the details of the invention being all capable of variation.

[*Printed, 3d. No Drawings.*]

A.D. 1813, November 9.—No. 3749.

WILKS, CHARLES.—“ A method of constructing four-wheeled “ carriages of all descriptions, whereby a facility of turning “ is obtained without having recourse to the usual mode of “ having what is called locks, or having any necessity for “ keeping the fore wheels of such carriages lower than the “ hinder wheels usually, or raising the bodies of such “ carriages higher than usual.”

In this invention both the fore and the hind axletree of a four-wheeled vehicle are so arranged as to turn upon centre pins, these pins being connected to the “ centre joist ” of the bed of a waggon, for example, or the perch of a coach or other carriage. To each axletree case are attached two curved iron bars, one being near each end of such case, the bars of each axle pointing towards each other and forming in fact portions of a circle radiating from the centre pin of the axletree. Passing between the curved bars of the front and those of the hind axle are diagonal rods, crossing each other, the ends of the rods being furnished with chains which work upon the curved bars, the ends of the chains being firmly secured to the axletree cases, and the patentee states that by these arrangements “ the fore and hind wheels will lock at the “ same time, reverse to each other, and consequently the “ carriage turn in nearly half the circle it would do if the “ fore wheels only were to lock as in the common way.” He also states that these arrangements render bolsters unnecessary in the construction of waggons although they will still be required in coaches and other similar carriages.

[*Printed, 5d. Drawing.*]

A.D. 1813, December 20.—No. 3770.

SPRATLEY, WILLIAM.—“ An improvement in the axletree of wheels for carriages of different descriptions.”

This invention relates to a combination of parts for securing wheels upon their axles, but in such manner as to admit of any desired amount of end play of the wheels, the oil being

securely confined, or as to prevent escape and waste of such oil, and other advantages being mentioned as arising from the invention.

The arm of the axle is much thicker near the inner end than elsewhere, and at the outer end is turned down to a small diameter, there being at the end of the small part, however, a knob or button, which is embraced by the inner parts of clamps or clips of case-hardened iron or other suitable metal, there being through the outer parts of these clamps holes for the reception of a linch pin, which at its head screws into the wheel box, and is prevented from rising by a cap; this pin securing the clamps to the box and so preventing the wheel from leaving the axle. The cap screws upon the outer end of the box, and has a hole therein, furnished with a stopper, through which hole oil may be introduced into the cap for the lubrication of the parts, a washer of leather being placed between the cap and a shoulder of the box to prevent the escape of such oil. The inner part of the wheel box is furnished with an internal shoulder which bears against the shoulder formed by the junction of the thicker with the smaller part of the axle arm, and beyond this the box embraces the thicker part of the axle, there being within this part of the box an "annular cavity" for the reception of oil, and the latter being prevented from escaping by the introduction of a leather collar into a recess in the inner end of the box, a collar of metal being finally screwed into the recess to keep the leather collar in its place, and the inner part of the box being surrounded and working within a "cutter or dirt hoop," fixed upon the axle. The latter is made of wrought or cast iron, case hardened or otherwise, and a longitudinal groove may be formed in the axle, or in the box, to aid in the circulation of oil.

In order to allow of end play to the wheel the holes through the clamps mentioned above are made oblong, thus allowing the clamps to move endway in the box "to an extent determined by the length of the hole." Or a screw thread may be cut upon the outer part of the clamps, and a collar or ferrule, which the patentee terms a regulator, may be screwed upon such part to a certain distance, a variation of such distance causing variation in the end play of the wheel, the position of the regulator being varied by means of a circular plate



provided with prongs, and having a head which passes through the cap of the box, and by means of which it may be turned round; a screw with a "flanch head" being so arranged as to determine the extreme point to which the regulator may be unscrewed. These arrangements may be varied, in some cases a ferrule or collar supplying the place of clamps, the button being secured to the end of the axle by screwing, or by a collar or ring and a nut. The invention includes "the application of the cup leathers used in pumps " to axletrees of any kind," to prevent the escape of oil.

[*Printed, 6d. Drawing.*]

A.D. 1814, March 12.—No. 3789.

BARCLAY, JAMES, and CUMING, WILLIAM.—"Improved " wheels and axletrees for carriages."

In this invention the nave of the wheel is composed of cast iron, brass, bell metal, or any other suitable material, the mortices for the spokes being wider at the bottom than at the top, and wedges being inserted into the lower ends of the spokes before they are driven into the mortices, such wedges causing the ends of the spokes to assume a dovetail form as the spokes are driven inwards, and so securing them in the nave. The body of each spoke is also bevilled at the shoulder, and the mortices formed to receive such bevilled part, this adding to the strength of the spokes. Into the front part of the nave are inserted two linch pins, which work in a groove formed near the end of the axle arm, a plate of metal which fits the nave being so arranged as to prevent the pins from rising. Before the wheel is placed on the axle arm a "hind cap" is placed against the shoulder collar of the axle, and a "cap collar" is then screwed against such shoulder collar. A ring of leather is then placed between the cap collar and the hind part of the nave, to prevent the escape of oil, and the hind cap is screwed against a flange on the nave, and revolves with it, this arrangement aiding the linch pins in keeping the wheel on the axle arm. A front cap is screwed against a flange in the front part of the nave, another ring of leather being between the cap and that flange, and there is an opening in the cap which is furnished with a screw plug, but which may be

opened for the admission of oil when necessary, such oil passing to the arm of the axle, in which is a broad groove for its reception and distribution.

[*Printed, 5d. Drawing.*]

A.D. 1814, April 7.—No. 3801.

ROBERTS, JOSEPH.—“An apparatus intended to be used for  
“map rollers and carriage blinds, and other similar objects.”

According to this invention a carriage or other blind, or any similar article, is mounted upon a roller at one end of which is a pinion which revolves therewith, this pinion being in gear with a spur wheel which on being turned in one direction winds up or charges a spiral spring. To the cloth of the blind or other article a cord is attached, having at its lower end a tassel, and by pulling at this cord the blind is drawn down, the roller being thus turned and winding up the spring, the latter being prevented from reacting so as again to wind up the blind until required to do so by means of a ratchet wheel connected to the pinion at the end of the roller, and a catch or pawl which acts upon the teeth of the ratchet. The blind may thus be drawn down to any desired extent, and will remain in that position until it is desired again to raise it, when by pulling at a cord connected with the catch or pawl and so liberating it from the ratchet wheel, the wound up spring, being no longer restrained, unwinds, and by turning round the spur wheel and consequently the pinion and roller rapidly winds up the blind. The spring and wheel as well as the pinion and ratchet, are enclosed in a suitable case or box, along with a spring which presses the pawl against the ratchet wheel, one form of box being set forth as specially adapted for a coach blind.

[*Printed, 8d. Drawing.*]

A.D. 1814, April 9.—No. 3802.

WHITFIELD, WILLIAM.—“Certain improvements in car-  
“riages.”

According to this invention a carriage wheel is furnished with a nave of cast metal, the outer end of which is solid and requires no cap. The inner part of the axletree, beyond the

arm, is "sexagonal," and upon the arm is placed a "screwed collar," the back part of which is also "sexagonal," and a second and larger collar being placed upon this portion and there secured by a screw or screws. Inside the inner part of the nave is a screw thread for the reception of the screwed part of the collar first mentioned, there being a recess in one part of this collar into which a "step" enters which projects from a solid collar formed upon the arm of the axle, a leather washer being placed between the two, the result of this part of the arrangement being that the inner part of the nave is securely closed up. In the collar on the arm of the axle is a groove, and in that part of the nave which surrounds it is a corresponding groove, an opening leading from this groove to the exterior of the nave through which oil may be introduced, the grooves serving to distribute such oil in the interior of the nave, a recess being formed in the arm and a cavity in the outer part of the nave serving as reservoirs for oil. The interior of the nave may be "sexagonal" in the part which works upon the axle arm, or the arm may be slightly flattened in two or three places, in order further to aid in the circulation of the oil, the collar on the axle being undercut for the same purpose.

Different modifications of the invention are described, collars of various kinds being set forth as applicable in place of those first mentioned, other minor details being varied according to circumstances. In the nave are mortices for the reception of the inner ends of the spokes, such mortices being either formed with parallel sides, or widest at the bottom, in which case the spokes are made to dovetail in the mortices by the introduction of wedges into the latter upon which the spokes are driven. Or wrought iron or steel spokes may be driven or screwed into the nave instead of wooden spokes.

"Boxes upon this principle may be made for wood naves, "or they may be made to fit into metallic naves, and there "secured by screwing or bolting them into each other," and the "principle" of the invention is also applicable to machinery in general.

[*Printed, 5d. Drawing.*]

A.D. 1814, April 27.—No. 3804.

GOMPERTZ, LEWIS.—Substitute for wheels. The inventor employs “legs or feet to support the carriage when they are  
“ beneath it; and upon them it advances for a certain distance,  
“ during which time the feet are stationary on the ground,  
“ till succeeding legs, being brought forward to support and  
“ advance the carriage in turn, and the legs which have  
“ performed their office are brought forward to repeat their  
“ action. The wheels, or substitutes for wheels, each consists of four radii or legs revolving on a centre or axletree  
“ in the usual situation, which radii have a power of extension  
“ and contraction in right lines to and from their common  
“ centre; and by means of certain curves” or cams “they  
“ contract and extend in such a law (during the period that  
“ they are in contact with the road) so as to support and  
“ advance the centre always at the same height.”

Similar results are obtained by the use of wheels placed under the carriage frame at a slight angle with the horizon, so that the legs which are attached to these wheels only bear on the ground at intervals. The carriage bears on the horizontally disposed wheels through the medium of friction rollers, and if the bearing surface of the wheels be undulated, there will be no rising and falling in the carriage as the feet come into contact with the ground. In all these cases the ends of the feet are fitted with little wheels, so that the carriage is able to move sideways if necessary.

The invention also relates to an axle in which the bearing of the nave of the wheel is upon a conical surface at the inner side of the nave, the end of the axletree being pointed and working in a screw cap to the nave.

Instead of cogwheels for communicating motion, the inventor makes use of a wheel having disposed on its side a number of pins fitted with friction rollers, which work in radially curved grooves on the side of another wheel.”

[*Printed, 1s. 5d. Drawings.*]

A.D. 1814, June 18.—No. 3817.

TINDALL, THOMAS.—“Propelling carriages.” The greater part of this specification is occupied by the description of a steam engine applicable to various purposes, the abridg-

ment of which description appertains to another series. This engine is also described as applied to the propulsion of vehicles. It is supplemented by a species of windmill which supplies the motive power to the economy of steam when there is wind. The exhaust is discharged through this mill and thereby assists to turn it. There may also be a "steam wheel" or rotary steam engine to work the wheels. The furnace is fed with coke by preference, which is made in a retort, part of the apparatus. The gas may be used for lighting or assisting the fire. Blowers are also fitted. The engine drives the vehicle by means of pushers worked by cranks or levers. One carriage is supported on five wheels, the single wheel being in front for steering purposes. The steering lever may be pressed down when desired upon the wheel periphery and so act as a brake. A carriage body having a door at the end may be supported by the hind wheels. Another form of vehicle described is on three wheels, the leading wheel being used for steering. This is worked by a modification of the former plan. This carriage is also shown as having scythes fitted to it, for cutting grass and corn, and also ploughs.

[*Printed, 1s. 2d. Drawing.*]

A.D. 1814, June 25.—No. 3818.

MABERLY, JOHN, and BARROW, JOHN.—"A method of securing carriage glasses."

This invention is intended to prevent the removal of carriage glasses "by stealth or otherwise," and consists "in the application of a lever bolt connected with the hinge of the carriage door, by which means the glass frame is bolted in whenever the door is opened, and cannot be taken out but by unscrewing the apparatus from the carriage."

The invention is minutely described, but the main feature thereof is the employment of the "lever bolt" mentioned above, which, however, is not connected directly with the hinge of the carriage door, but is moved in one direction by a sliding bolt, which moves in bearings formed in or connected to the hinge, and in the other direction by a spring. The "lever bolt" is placed upon a fulcrum inside a case fixed in the frame of the carriage door, the bolt being in a nearly vertical position, but its lower end being bent into a horizon-

tal position so as to enter a notch or recess in the frame of the glass, towards which it is constantly pressed by a spring, being withdrawn from the notch when the door is closed by the end of the sliding bolt pressing against the upper part of the lever bolt, in which is a notch for its reception, the sliding bolt being then forced forward by a piece of steel placed for the purpose, but such sliding bolt leaving the piece of steel and setting the lever bolt at liberty when the door is opened, the latter bolt then securing the glass frame.

[*Printed, 6d. Drawing.*]

A.D. 1814, July 26.—No. 3827.

DONCASTER, WILLIAM.—“Easing the draught and accelerating the motion.”

The improvements included in this specification relate to various subjects. A method of “breaking the ruggedness of uneven roads” by means of “hydrostatic power acting horizontally, when any shock takes place” is mentioned but is not further described.

For accelerating velocity, the front and main wheels of a carriage are worked together by bands. “The fore wheel has generally not only two revolutions to one to make in comparison with the hind wheel, but has to act as pioneer into the bargain. This then resolves some of the power of the great wheel into the velocity of the smaller one.”

[*Printed, 6d. Drawing.*]

A.D. 1815, February 21.—No. 3886.

BURRELL, JOSEPH.—An invention “to be used as a support and safeguard in getting in and out of chaises, curricles, and other two-wheeled carriages.”

This invention consists of “an iron or brass support or guard, a foot or more or less in length, and of proper size and form for the hand to bear upon, to be placed above the rim of the wheels of chaises, curricles, or other two-wheeled carriages, in such a position as to be used as a support in getting in and out, and a guard to prevent the wheel turning against the hand, as there will be no occasion to bear upon the wheel, as is frequently done in getting in

“ and out. This guard is to be placed above the wheels at  
“ such a distance as on no occasion to touch the wheels, nor  
“ the soil hanging upon the wheels; it is supported at one  
“ end by a strong iron going across the shafts or frame of the  
“ chaise, curricie, or other two-wheeled carriages, and at the  
“ other end by an iron fastened to the body of the said chaise,  
“ curricie, or other two-wheeled carriage, forming when fixed  
“ a support and guard, and making it much more safe, easy,  
“ and convenient to get in and out of chaises, curricies, and  
“ other two-wheeled carriages than it otherwise would be.”

[*Printed, 3d. No Drawings.*]

A.D. 1815, April 29.—No. 3911.

BUSH, WILLIAM, the younger.—“ Invented method for preventing accidents from horses falling with two-wheel carriages, especially on steep declivities, superior to any hitherto known or in use.”

This invention relates to an apparatus which is made of iron or other suitable metal or material, and which the patentee denominates “ a sledge or sliding sole, or a safety wheel (when a wheel is attached thereto),” this apparatus much resembling in form an ordinary shoe, being turned up at one or both ends to prevent it from burying itself in the road, and being from three to four inches broad, and from eight to twelve inches long. In the upper part of the sledge are pivot holes, and through these holes are passed pivots which also pass through back and fore braces, these thus becoming jointed thereto at their lower ends, the back brace proceeding backwards in a diagonal direction, and being furnished with catches at the upper part which may any of them be locked into an eye attached to the middle of the axle, and the height of the sledge be thus adjusted; such adjustment being, however, if preferred, effected by means of a pin passing through a hole in the brace, of which a number may be formed. To the upper end of this brace a ring is fastened, and when the apparatus is not required to act it is held up by a hook upon which this ring is passed. The fore braces pass forward in a diagonal direction and are connected at their upper ends, by means of screws or other suitable fastenings to the shafts of the vehicle. If desired, the apparatus may be provided with

small wheels, upon which it will run when in action instead of sliding on the ground.

[*Printed, 9d. Drawings.*]

A.D. 1815, May 11.—No. 3913.

PITT, CHARLES.—“The method or methods for the security and safe conveyance of small parcels, and remittances of property of every description, and also for security in the formation and appendage of shoes.”

That part of the invention which relates to the security and safe conveyance of small parcels and remittances of property consists, says the patentee, in “making one or more of the seats of mail and other coaches to form a box or case from which a drawer is to slide, opening through the pannel on the outside of the coach, in which drawer may be deposited as many different boxes as may be required. This drawer to be supplied with a good lock and keys, one of the keys to be kept in London, and another by each of the persons in trust, who on the arrival of the coach can take the moveable box out of the drawer belonging to that town, and in its place to put the one to be forwarded from thence. All this may be done with a facility equal to the changing of post bags. Neither the guard, coachman, nor passengers have controul over the parcels, as by means of an iron bar at the top of the coach, reaching to the back, with a spring exactly perpendicular to the centre of the said drawer, which top bar communicates with two perpendicular bars reaching to the bottom of the said drawer at the centre part thereof. The top bar has at the back of the coach a hasp and staple, which are secured by a padlock, the key of which is under the control of the guard, and which, until he releases, no person even with the key can open the drawer.”

As regards remittances in particular, the invention consists in the preparation of sheets of paper, which may be stamped or otherwise printed in the manner set out in the specification.

Another part of the invention relates to forming the shoes of horses so as to enable them to travel with safety in either frosty or other weather.

[*Printed, 5d. Drawing.*]



A.D. 1815, June 14.—No. 3927.

POPE, WILLIAM.—“Certain improvements in or on wheeled  
“carriages, and also the method or methods of making the  
“said carriages go with or without the assistance of animals,  
“which method or methods may be applied to other pur-  
“poses.”

This invention, which is very imperfectly described, consists in the first place in an arrangement by which the body of a cart may be tipped backwards for the purpose of unloading, the apparatus employed consisting of a rack which is jointed at one end to one of the timbers of the lower frame of the cart, and which is moved to and fro by means of certain racks and pinions mounted upon shafts which are supported in bearings connected to the shafts of the cart, and turned by means of a winch. To the front parts of the ordinary shafts other shafts are connected, the latter being jointed to a curved piece which passes across the former, and the patentee mentions that the racks and gearing will move the body of the vehicle “forward or backward on the shaft,” and that by means of the additional shafts “the effect is extended to the  
“rest of the team,” but how these results are to be produced is by no means apparent. According to another part of the invention the wheels of a vehicle have pinions fixed to their naves which give motion to certain horizontal wheels, the latter being employed to wind up springs, the reaction of which may be made use of to move the vehicle either backwards or forwards, the horizontal wheels being upon a moveable vertical axis, by changing the position of which either of the horizontal wheels may be brought into action. In this part of the invention the main shafts of the vehicle (of which there are two pairs) are provided, at the parts at which they are connected to the fore carriage, with adjusting screws by which the weight upon the horses’ backs may be regulated, and on the perch is a spring which is apparently meant to sustain the body of the vehicle, a roller being also connected with the perch, the object of which is “to keep the fore carriage  
“up when the adjusting screws are pressed down.”

[*Printed, 8d. Drawings.*]

A.D. 1815, November 14.—No. 3958.

MORTON, GEORGE.—“ A mode of attaching horses to carriages  
“ and all other four wheeled carriages.”

This invention relates to all kinds of vehicles, “ either with  
“ wheels or without wheels,” which are applicable to the  
transport from place to place of either passengers or mer-  
chandise. The invention consists “ in reversing to a certain  
“ degree what has hitherto been the practice in respect of  
“ working or removing loads or weighty substances by means  
“ of carriages ; ” “ and in cases where animal power is to be  
“ used, instead of placing all the animal power before the  
“ load ” a certain proportion of it is placed “ in shafts behind  
“ the carriages, and in some instances, namely, when the  
“ portion of the upper part of a load overhangs behind and  
“ above the head of the animal or animals placed in the shafts  
“ behind, a part of the load will necessarily be above or over  
“ part of the power or animal or animals that may be placed  
“ in such shafts. When the animal power is to be derived  
“ from a horse or horses or other animals of similar or nearly  
“ similar height and proportions the said shafts, whether for  
“ one or two such animals, are to be attached to the hind part  
“ of the carriage, however denominated or constructed, in  
“ such manner as to produce, by the exertions of the horse or  
“ horses, or of such other animal or animals as may be placed  
“ within and attached to the shafts, a propelling influence  
“ acting on the hinder part of the carriage, whether with or  
“ without any load or burthen beyond its own weight. Hence,  
“ the invention is distinguished by the name of propelling  
“ shafts.”

The patentee states that there is nothing new in the mode  
of attaching the propelling shafts to carriages, and that such  
mode must necessarily be determined by the construction and  
form and other particulars of the carriage to which the shafts  
are to be connected. He mentions, however, that before  
connecting such shafts to a four-wheeled carriage a “ moving  
“ bar ” must be attached to the head piece by means of  
thimbles and eyes or some other kind of hinges, an iron pin  
passing through the middle of this bar ; this pin being called  
the “ shaft pin ” and with some minor details, serving to  
connect the propelling shaft to the carriage.

“Various other methods of attaching the propelling shafts to a carriage, besides that above described, will occur to many persons, and each will adopt that which may appear to be most suitable to his particular case and convenience.”

[*Printed, 4d. No Drawings.*]

A.D. 1816, January 9.—No. 3973.

REYNOLDS, JOSEPH.—Propelling carriages, &c. This invention relates to the propulsion of vehicles by steam machinery. To the wheels are attached other toothed wheels which are driven by toothed gearing from the engine shaft. Each toothed wheel is capable of being thrown in and out of gear by means of clutch apparatus, so that turning may be facilitated, and for further facilitating turning a small toothed pinion is so disposed on a shaft between the main toothed wheels, that upon one wheel being disconnected from the driving gear and the other wheel being driven, the former and disconnected wheel is caused to turn in the reverse direction.

The main wheels of the carriage may be more properly called rollers, being very wide. A third wheel runs in front of the carriage. Both the main wheels may be disconnected from the driving gear if desired. The boiler is supported on an axis, so as to be always horizontal.

[*Printed, 1s. 1d. Drawing.*]

A.D. 1816, February 10.—No. 3982.

MILTON, WILLIAM.—“Certain improvements upon the wheels and perches of carriages.”

This invention consists “in making the lock of a four-wheel carriage as practicable with wheels however high before as it is with the low wheels now commonly used, and in making such high wheels more capable of enduring violent shocks than by the present mode of making they would be.”

An arrangement is described in which the hind body of a carriage or other vehicle is mounted upon a pair of wheels the axle of which apparently passes through the body at some distance from the bottom, there being connected to the top of this body an upper and to the bottom of the body a lower

perch, these perches extending forward, and these being near the front end of such a bolt hole. The fore part of the body of the vehicle is represented as being similar to the hind body, and mounted upon wheels of the same size, a perch bolt passing vertically through the middle of this body and having its upper and lower ends inserted into the holes in the perches already mentioned; or instead of a long perch bolt an upper and a lower pin may be used. By this arrangement the fore carriage locks with ease, although upon large wheels, a stop or check is so arranged as to prevent the retiring wheels from touching either of the perches. In forming these high wheels a wooden nave has in the first place as many flat faces or planes formed along its length as there are meant to be spokes in the wheel. Each spoke is composed of planking or framing which tapers in breadth from the nave to the felly, and at the inner end of each spoke is a piece of wood the inner face of which corresponds with one of the faces of the nave, while at the outer end of the spoke is a larger piece of wood, the outer part of which is curved to correspond with a portion of the interior of the felly, to which it is fastened, the piece of wood at the inner end of the spoke being fastened to one of the faces of the nave, the sides of such piece being so bevilled inwards that the piece attached to one spoke fits closely to the sides of the pieces next to it, the whole circumference of the nave being thus occupied, and the pieces of the different spokes contributing "to keep each other well in their places."

[*Printed, 5d. Drawing.*]

A.D. 1816, March 2.—No. 3986.

TURRILL, FRANCIS.—"A new or improved wheel guard."

This invention consists in the application of a shield or guard over part of the periphery of a wheel "for the purpose of preventing dirt upon the tire of the wheel soiling the clothes of ladies or other persons in getting in or out of the carriage" with which the wheel is connected. This shield or guard may be composed of one piece, or of two, three, or more pieces connected by folding joints, sliders, or other suitable means which will allow of such pieces being opened out or unfolded when it is necessary to apply the guard to the wheel, and such piece may be formed of light iron or any

other kind of framing covered with leather, velvet, cloth, or such materials as are usually employed in lining or covering carriages. This guard may moreover be made to fold upon joints or hinges of any suitable construction, or be connected with slides "to draw out at the option," a convenient method for close carriages being mentioned in which the guard is connected by joints or hinges to the steps, and folded up within such steps. In the case of a curricule wheel guards may be affixed either to the shafts or to any other part of the vehicle, and be made to fold and unfold, or to slide, as may be thought most convenient.

[*Printed, 5d. Drawing.*]

A.D. 1816, March 14.—No. 3991.

STEAD, JOHN.—"A stage coach or other coach or carriage for the carrying of passengers, and lighter and more commodious than usual; that is to say, for the carrying of four or more inside passengers, and also six, eight, ten, or more outside passengers with greater safety than those now in use carrying the same number of passengers."

The leading features of this invention consist in placing the seats for the outside passengers so much lower than usual that the passengers are thereby carried more safely, such passengers being only separated from the inside passengers by the front of the body of the coach; in an arrangement of lockers for luggage under the seats for the outside passengers; and an arrangement relative to the boot of the vehicle.

The vehicle is composed in the first place of a lower frame which is nearly oval in form, the ends only being straight for a portion of the distance through which they extend, and the frame being provided with a number of mortice holes for the reception of the lower ends of pillars which form part of the skeleton of the body of the carriage, such skeleton being enclosed by pannels of sheet iron or other metal which have been beaten into form in moulds. The whole body of the vehicle embraces a raised front seat for the driver and others, behind and lower than which is an open part furnished with seats, and resembling the body of an open carriage, being furnished with doors at the sides if desired, there being behind this again an enclosed part for inside passengers, furnished with windows at the sides, an opening in front, and

a door behind. There is a boot under the front seat for the reception of luggage, provided with a suitable door. Under the seats in the open part of the vehicle are lockers, also for the reception of luggage, and suitable steps are arranged for convenience of access to different parts of the vehicle. The invention includes a mode of oiling the wheels of the vehicle which consists in connecting an oil box to the bed of each axletree near to the nave of each wheel, a pipe leading from this box through a part of the bed and to a groove in the arm of the axle from which it is distributed over the arm.

[*Printed, 9d. Drawings.*]

A.D. 1816, May 4.—No. 4022.

BANKS, RICHARD.—Hanging vehicles and facilitating draught. Part of this invention relates to an improved construction of waggon. The hind wheels are larger than usual, and the perch, instead of being in its usual position, is replaced by two perches, one on each side, the body of the waggon being between them and hanging as near the ground [as possible. Springs are attached to these perches and from these springs the waggon is suspended by slings. The shafts are attached to the body and not to the axletree. A pin connects the shafts with the framing attached to the fore wheels, by which means they are guided. Carts are similarly hung on springs with large wheels, but they move backwards and forwards as next described.

The second part of the invention relates to gigs and other two wheeled vehicles. They are so constructed that the bodies are capable of being moved forward or backward, on the wheel frames or shafts, as the inequality of the ground may require. The horse, in one case draws directly upon the body, so that the latter moves forward on inclined planes on the wheel framing; but on the horse ceasing to draw, the weight goes back on to the springs. Instead of rollers and inclined planes, there may be racks and pinions. Modifications of the system are shown.

The improvements also comprise a wheel with steel spokes set at angles in an iron nave. A spring axletree, which is elastic under heavy pressure is also described.

[*Printed, 1s. 9d. Drawings.*]

A.D. 1816, June 20.—No. 4042.

BURNETT, JOHN.—“A convolving iron axletree for the reduction of friction and animal labour, by the application of which wheels of carriages of every description are prevented from coming off whilst travelling and carriages are drawn with less animal labour.”

In this invention the axles “are made of wrought iron in two parts or arms, with two metal or other bearings, or otherwise with metal tubes or boxes to be attached to the pillar of any carriages by bolts and screws or iron hoops, or by any other suitable method.” The naves of the wheels are of cast iron, or any other suitable material, each nave having an axle arm fixed or made fast thereto by means of a bolt or otherwise. “The axle arms are made as long as the breadth of the carriage will admit, so that the screws in the end of the boxes do not touch in the centre; the longer the arm the less the friction and more steady the carriage. The bearing is but three inches (more or less) near the shoulder, and two inches (more or less) at the small end; this must be guided by the width of the carriage. The middle space of the arm runs clear from any friction, and does not touch the box or tube. At the end of the tube or bearing is a screw that forces a piece of cast steel or any other hard substance against the arm itself, by which means the friction at the back of the nave of the wheel and the box or tube or bearing is dispensed with. At the end of the tube or box is a screw hole for supplying the axle with oil.”

The bearings of the axle are represented in one of the figures of a drawing annexed to the Specification as being connected by means of bolts and hoops to a wooden case.

[*Printed, 6d. Drawing.*]

A.D. 1816, November 1.—No. 4079.

SNOWDEN, WILLIAM.—“A new or improved apparatus or machine to be attached or applied to carriages to prevent their being overturned.”

In this invention a pendulum has at its upper end a cross bar, near the ends of which are pins, which, during the ordinary working of the carriage, support certain levers against the ends of which rest the upper ends of other levers,

there being connected to the latter certain chains which pass partially around certain pulleys placed to receive them, and which chains are also connected to certain "projectors," the the latter consisting of bars which each carry at its lower end a wheel or pulley. The result of this arrangement is, that on the body of the carriage being thrown to a certain degree out of the perpendicular, the pendulum by its movements liberates one of the levers to which the chains attached to the projectors are connected, that projector then immediately passing diagonally downwards, and bringing the wheel or pulley at its lower end into contact with the ground, thus preventing the carriage from being overturned. In order to sustain the projector in its action it is furnished with ratchet teeth, with which, on its descent, a click or catch engages, thus preventing the return of the projector until requisite. Instead of a wheel the projection may be furnished with a piece of metal in the form of a crescent, and suitable arrangements are made for the purpose of restoring the parts into their original position after being in use. The projector is described as being combined with the "step bars," additional or perpendicular bars being combined therewith in some cases.

[*Printed, 10d. Drawing.*]

A.D. 1817, January 20.—No. 4092.

MANTON, WILLIAM.—"Improvement in the application of "springs to wheel carriages."

This invention consists "in placing the springs which are "to support the body of the carriage in a transverse or cross "position, so that the length of the springs will be in a "direction from side to side of the carriage," and so that "each spring shall be fixed to the body, or suspended part of "the carriage, on one side thereof by one end of the said "spring, which spring shall extend crossways beneath the "body of the carriage, and be attached to the frame or "carriage on the opposite side to that side on which the "other end of the same spring is fastened to the body of the "carriage."

One modification of the invention is described as being suitable for a gig, in which uprights or blocks are fixed upon the axletree, a cross rail passing from one of these blocks to the



other, and the whole forming a frame. The plates of which the springs are composed are so arranged that the springs are much thicker at one end than at the other, the thick end of each spring being secured to the under side of the body of the vehicle, and the springs then crossing each other, passing diagonally downwards, and having their lower and smaller ends connected by means of shackles, loops, or links to the frame. In the case of a four-wheeled vehicle the smaller ends of the springs are connected by means of shackles to curved irons which rise from the fore transom such irons being each carried a little sideways, in order that the springs may clear each other, a point which should be attended to in all arrangements, the details of the invention being capable of modification.

[*Printed, 6d. Drawing.*]

A.D. 1817, February 20.—No. 4102.

HARDY, ROBERT.—“Certain improvements in the manufacture of cast-iron bushes or pipe boxes for chaise, coach, waggon, and all sorts of carriage wheels.”

In carrying out this invention a pattern is first formed, either of iron or some other suitable substance, such pattern being “exactly the shape and size” of the bush or pipe required; and being made in two, three, or more parts, which may be coupled together when used. A pin or core of iron or other metal is then formed, of the size of the opening which is required in the bush or pipe, and this core is provided with an opening through which melted metal may be poured into the mould, and also with an aperture for the escape of air during the process. The mould consists of a flask, which is made in two or more parts, and “exactly the same height as the length of the pipe or bush,” having “seats” in the top and bottom for the reception of the core, the ends of which are turned at the parts which are to enter the seats. When the metal has been poured into the mould, and become “set,” the core pin is driven out, in order to prevent the pipe from bursting by the contraction of the metal, the rest of the operation being conducted in the ordinary manner.

[*Printed, 3d. No Drawings.*]

A.D. 1817, March 11.—No. 4110.

PANTER, WILLIAM. — Anti-friction axles. This invention consists in surrounding the axle with a number of anti-friction rollers, which revolve between the axle and the box containing them. These rollers are held in a lantern consisting of two rings kept apart by bars or pillars. The ends of the rollers are conical and fit into holes or angular cavities in the two rings. The drawing shows a carriage axle, having two of these lanterns and rollers fitted inside the box with which the nave of the wheel is lined. To prevent friction between the ends of the box and the outside of the lanterns, a washer or thin loose ring is interposed, and moreover the surfaces which come in contact with the washer are convex, the washer being flat. Or the washer may be convex and the surfaces flat. Similar means may be adopted to take up the friction of the axle in the direction of its length, the washer being placed between the linch and the box. The end of the axle may be pointed to bear against a cap fastened to the nave. This contrivance prevents the other end of the box bearing against the shoulder on the axle tree. A hoop of iron surrounds this shoulder to keep off dirt.

[*Printed, 7d. Drawing.*]

A.D. 1817, July 19.—No. 4143.

WYKE, GEORGE, and SHORTER, EDWARD.—“Certain improvements in the construction of wheel carriages.”

This invention consists in the first place of a vehicle, the body of which is divided into two parts, entirely separate from each other. The front part constitutes a coach or chariot body, “built with straight timber, or any other form, with crooked or straight timber,” while the second or hinder part constitutes “an open car, to hold or carry the outside passengers,” having “a standing top or canopy” provided with rods and curtains, the latter of which may be drawn at pleasure in order to shelter the passengers from inclement weather, which canopy, however, may, if desired, be dispensed with. This car is united to the front part of the vehicle by a perch which has a bolt or pin under the body, passing through the sweep of the carriage, this bolt or perch pin allowing the carriage to turn round and lock the fore wheels,

passing between the two bodies till checked by a stop which prevents the fore wheel striking the perch in locking or turning. Instead of the two parts of the body of the vehicle being entirely separate they may be attached to each other, "in which case the fore wheels are to be fixed in every respect as coaches or four-wheeled carriages are commonly built."

The springs of the vehicle are composed of "one plate of steel," and may be of various forms, such forms embracing not only the ordinary form, or that in which the two end parts of the spring curve gradually upwards from the centre, but also the "barrel or clock" form, which is mentioned as being most suitable for gigs or other two-wheeled vehicles. An arrangement is set forth in which a barrel spring is placed in the front part of the body of a gig or other two-wheeled vehicle, a lever proceeding from the bearings of the vehicle, over the axletree, and being connected to the barrel spring by a leather or other strap which passes round the barrel.

[*Printed, 5d. Drawing.*]

A.D. 1817, August 28.—No. 4165.

CHAMPNESS, JAMES MASON, and BINKS, HENRY.—"Certain improvements in axletrees for carriages of various descriptions."

In this invention the axletree is "perfectly straight, and in the rectilinear progression of the carriage turns with the wheels, as one end of the axletree is fixed fast in one of the wheels; but as in the act of turning one wheel must move faster than the other, the opposite wheel is put on in the usual way. In the straightforward motion of the carriage the axle turns with the wheel, and at all times supports the weight of the carriage upon friction rollers acting on bolts of steel or iron, case-hardened and fixed on the boxes which contain the oil, the sizes of the boxes and rollers to be regulated by the size of the different carriages to which they may be applied, and the difference of the weight they may have to support. There is also a brace or steady pin fixed to the boxes to keep them in their proper position."

The patentee states that by this invention the friction upon the axle is reduced to a mere trifle, and that the wheels,

“ being upon a cylindrical and not a conical form, and standing upright, the friction upon the ground is entirely prevented,” such friction creating a very serious addition to the draught, as well as the injuring the roads, when the wheels are of the “ common or conical construction.”

[*Printed, 3d. No Drawings.*]

A.D. 1818, January 15.—No. 4200.

KOSTER, JOHN THEODORE.—“ New or improved method of building or constructing wheeled carriages, as also for making or constructing wheels for carriages.”

The “ principle ” of this invention consists in “ causing the greatest part, or in preference the whole, of the weight of the vehicle and its load to rest upon the two extremities of the axletree or axletrees outside the wheels, in place of between the wheels,” as usually practised.

For carriages of heavy burthen, such as carts, the body is made somewhat wider than the truck on which the wheels are to go, the outside pieces of the bottom thereof resting upon and being firmly fixed to blocks of wood or metal which are perforated to receive the axletree, the latter being perfectly straight, and after being introduced through them and through the naves of the wheels, being secured from turning round or coming out “ by a small bolt or pin passing through the block and the end of the axletree, or by making the ends of it square, with a screw and nut, or other methods, and it is thus easily removeable for any purpose.” The wheels may either be of the usual construction or be made according to one part of the present invention, which consists in “ making the rim or felloe an entire circle of cast or malleable iron, of the required breadth and thickness, with sockets, mortises, or other contrivances in the interior thereof cast with or welded to it, and corresponding to the number of spokes and open on one side,” there being then driven into or fixed in the nave, whether of wood or of metal, the required number of wooden spokes, the ends of the latter being brought altogether in the said sockets or mortises, and being then wedged tight and secured by rivets, screw bolts, or other methods. The nave, whether of wood or iron, should be somewhat larger than usual, the spokes being placed as near the outward end

as practicable, and the other end projecting inward towards the centre of the body. "The rim or felloe should be perfectly cylindrical, whether broad or narrow. The wheels may be kept in their places either by linch pins through the axletree or through the nave, and running in a groove in the axletree, and they may be greased either by removing the axletree or by pouring oil or any liquid grease through an aperture in the nave. If the wheels are required to be high they may protrude through an opening in the bottom of the body, and be covered with a cap or case; if low wheels only are required they may run entirely under the body. The body of a waggon may be constructed exactly in the same manner, and a break being made at the point where the fore wheels lock the fore part may be raised sufficiently high for the fore wheels to go under it and swivel entirely round by means of a horizontal circle like any other carriage without a perch. For the fore wheels to answer the purpose of an under carriage an open rectangular frame may be made of the required size and strength, and the outside pieces thereof rest upon blocks as before described."

For light carts and waggons, springs, "either what are called grasshoppers or elliptic, or any other forms, may be applied between the body or between the frame and the blocks or other supports; and for coaches, chariots, &c., frames rectangular or varied in shape may be adapted to each pair of wheels, the outside pieces thereof resting upon springs, and these upon the blocks or other supports, as before described. The fore and hind frames may be connected with a perch, straight or crane-necked, or by the body only, or in any other manner, and the usual or any different shaped bodies may be placed or hung upon them in any manner whatever," the patentee mentioning that in all cases he would place the point of draught as low as practicable, "so as to give the greatest possible inclination to the line of traction upwards towards the shoulder of the horse, and to accomplish this the shafts or pole, or by whatever else the carriage is drawn, especially if on two wheels only, may be attached to the ends of the axletree, or to the blocks immediately under or over the axletree; and the body of a cart on this construction is peculiarly convenient

“ for the application of the rack, many years partially in use,  
 “ for elevating the fore part of the body in going down hill,  
 “ as in this with the same facility and by the same means it  
 “ may be depressed in going up hill.”

[*Printed, 5d. Drawing.*]

A.D. 1818, January 23.—No. 4207.

BANKS, RICHARD. — Facilitating draught. The inventor first points out that the weight in a two wheeled carriage is so disposed that on a level road it has little tendency to press on the back of the horse or to operate to raise him from the ground; but that when he ascends a hill, the incline “converts the axletree into a fulcrum between the weight and the power or horse, and in proportion to the distance of this weight from the fulcrum is the tendency to lift the horse from the ground, which disables him or prevents him from exerting his full power.” On the other hand when descending a hill, the weight is placed “between the fulcrum and the power or horse. The weight thus situated presses him to the ground, and in passing down steep hills it is both difficult and dangerous.”

Accordingly to obviate these defects, the inventor arranges the body of the vehicle on the wheel framing, or axletree, in such a way that when the horse is mounting a hill, the strain of the draught on the tawtree forces, by means of levers, the axletree in a backward direction, so as to bring the weight of the carriage between the axletree and the horse. Similarly, in descending a hill the horse in order to hold back the carriage retires against the tawtree and forcing back certain levers brings the axletree forward of its normal position, and so again by shifting the weight this time behind the axletree, relieves the horse's back from weight. Various methods of carrying this system into practice are shown.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1818, January 27.—No. 4212.

ACKERMANN, RUDOLPH. — (*A communication from George Lenkensperger.*) — “Improvements on axletrees applicable to four-wheeled carriages.”

In this invention each of the arms of the front axletree is

united with or by preference formed in one piece with what the patentee calls a vertical axle, which is a round axle capable of turning in a hollow box or socket passing through the fore transom of the carriage, no fore axletree bed being required. The vertical axles with which the axle arms form right angles, constitute "separate centres of motion round which the axle arms can be turned with an horizontal rotatory motion in order to place the fore wheels in an oblique direction when the carriage is required to turn." In order to communicate motion to both of the axle arms at one time a lever, which the patentee calls a stay, is firmly connected to each of the intersections or elbows which form the points of junction between the vertical axles and the axle arms, such levers or stays proceeding backwards and being curved upwards and connected together at the ends by a bar called the "controlling bar," there being jointed to the middle of this bar the futchel, and this bar thus also supplying the place of a sway bar. "The futchel being attached to the middle of the fore transom by the perch bolt, and the pole being jointed to the futchel in the usual manner, the futchel and pole can turn about upon the perch bolt as a centre of motion, and then the hinder end of the futchel will act upon the controlling bar in the manner of a lever, and this action will by the said bar be transmitted to the stays or levers of the axletrees so as to turn the vertical axles round in their sockets, and place both axle arms and fore wheels in an oblique direction at the same time."

"The splinter bar from which the horses draw is bolted to the futchel in the usual manner and braised by iron stays; it must be fixed at such a distance from the perch bolt as to allow full play for the fore wheels at their greatest obliquity," and if the distance between the two vertical axles be made greater than the distance between the joints of the controlling bar "it will occasion that fore wheel which is on the side to which the carriage is intended to turn to have a greater degree of obliquity than the opposite wheel," which will be "conducive to quick turning." If the controlling bar, moreover, be so curved that the joint in the middle of it be moved one or two inches backwards the futchel will act with greater leverage, and may consequently be shortened. The pin which connects the bar with the futchel must be fixed in

the bar, and the opening in the futchel through which the bar passes must be in the form of an oblong hole or slot in order to allow the pin sufficient play during the movements of the parts. Instead of vertical axles being employed the axle arms may be united to the ends of the fore transoms by means of hinges, the other parts of the apparatus remaining the same. The invention may be applied to the front wheels only of a four-wheeled vehicle, or to all the four wheels.

[*Printed, 6d. Drawing.*]

A.D. 1818, April 8.—No. 4242.

HOPKINSON, WILLIAM.—“A machine or apparatus to prevent the wheels of waggons, carts, coaches, and all other carriages from coming off by accident, and which is denominated or called a wheel detainer.”

This invention consists essentially in the employment of a hoop which according to one arrangement is affixed to the inner part of the nave of a carriage wheel, there being around this hoop a screw thread, and there being firmly attached to the axletree or axle bed a catch or “cuttoo,” this being composed of a piece of metal which projects horizontally for some distance from the axletree or bed and then turns inwards between the thread upon the hoop and the nave of the wheel. The thread is closed on the side next the bent part of the catch by a strong spring, and the result of the arrangement is that the thread acts as a flange, against which, should the linchpin or other retaining apparatus of the wheel become displaced, the bent part of the catch bears, and so prevents the wheel from leaving the axle. The object of this flange being formed as a screw thread closed by a spring is to enable the wheel to be taken off the axle and replaced thereon without disturbing the catch, the spring being in such case forced back by the application of a suitable instrument so as to allow the catch to enter between the threads of the screw, when by turning the wheel round it may be withdrawn from and again replaced upon the axle. Instead of the hoop and screw thread being connected to the nave of the wheel it may be attached to the axle or axle bed, and the catch or “cuttoo” to the wheel, the invention being capable of various modifications, of which several are described.

[*Printed, 10d. Drawings.*]



A.D. 1818, November 12.—No. 4308.

CLARK, GEORGE JAMES.—“An apparatus for the more easily affixing the drag to a carriage wheel.”

According to this invention a shoe or drag is connected to one end of a lever, which at the other end is mounted upon a fulcrum connected to the axle of the hind wheels, on the back part of the perch of the carriage, this lever being so arranged that when at liberty the end carrying the shoe or drag descends and allows the shoe to pass under one of the hind wheels. When not required for use the shoe is raised into nearly a horizontal position by means of a chain connected to it and which passes forward below the body of the carriage and up to the footboard, passing through an aperture in the latter and having a ring at the end by which it may be operated upon by the driver, certain guide pulleys directing this chain in its course from the footboard to the lever. The chain is held in position, when the lever is raised by a plug near the upper end of the chain, the aperture in the footboard being wide enough in one part to allow the plug to pass through it, while in another it is so narrow as to retain it. When it is requisite to apply the drag the driver so moves the chain that the plug is enabled to pass through the wider part of the aperture, the lever then descending and the shoe passing under the wheel as already mentioned, being restrained from passing too far under the wheel by a drag chain of the ordinary character.

[*Printed, 8d. Drawing.*]

A.D. 1818, November 19.—No. 4312.

MATTHEWS, HENRY.—“Certain improvements applicable to wheeled carriages, or vehicles of different descriptions, calculated to render them more safe and commodious.”

After mentioning various disadvantages arising from the ordinary mode of constructing stage or other coaches the patentee proceeds to state that the present invention consists in the first place in an arrangement of double seats in the centre of the vehicle for inside passengers, so arranged that they may sit nearly back to back, “looking towards the side windows, so that they may see the prospect, have room for their legs, and not incommode each other.” The spaces

below the seats are converted into receptacles for luggage. The seats for the outside passengers are on about the same level as those inside the vehicle, that part intended for such outside passengers much resembling an open carriage having three rows of seats, and accommodating twelve passengers, there being accommodation inside for four only; the spaces under the outside seats, like those inside, being arranged for the reception of luggage, the whole of the luggage being "under lock; no part of it exposed to wet or pilfering, or left to incommode the passengers." The axles are made longer and the wheels placed farther asunder than usual, in order to lessen the danger of the vehicle being overturned in case of the wheels running over obstructions, and in order still further to guard against such an accident certain "pendant crutches" are suspended from the sides of the vehicle, so that on the latter leaning to a dangerous extent either to one side or the other the lower end of the crutch on that side comes into contact with the ground, and the vehicle is thus effectually prevented from being overturned. In order to prevent the wheels from leaving the axles the box of each wheel "may be of equal diameter at both ends, to admit of the axletree or arms being put through from the outside," such arms being bolted to the bed of the axle, and there being at the end of each arm a knob which retains the wheel therein. This arrangement is meant to be applied in building new vehicles, but an arrangement which will serve a similar purpose is mentioned as being applicable to other vehicles, this consisting in adapting padlocks to the ordinary linchpins, "so that nothing but the proper key can take off the wheel or draw out the linchpin."

In a single horse chaise the patentee causes "the greater part of the weight to hang to the back springs," the front springs having oblong openings or eyes near their ends, the springs which pass from the bottom of the chaise not being fixed to the front springs, on which they rest, but being provided with small irons which pass through the eyes and extend downwards to near the ground, and are formed near their lower parts into steps by which access to the vehicle may be obtained, thus upon the horse falling the front of the vehicle can only fall through a very short distance, when it will be sustained by the lower ends of the irons. The hood of the

vehicle is composed of silk in order that it may be lighter than usual, and is concealed between the panels and the stuffing, "except when it is required to be up," the first joints being upon raised standards, and forming hinges upon which the remaining joints are raised from the back, certain irons connected to the sides of the vehicle being used to sustain the hood when raised. A broad belt is so placed as to prevent persons from being thrown out of the vehicle in case of collision, or of the horse falling.

The invention includes the formation of grooves inside the box of a carriage wheel, so arranged that the interior of the box only touches the axle arm in three places, this reducing the friction between the arm and the box.

[*Printed, 6d. Drawing.*]

A.D. 1818, December 22.—No. 4321.

JOHNSON, DENIS.—"A machine for the purpose of diminishing the labour and fatigue of persons in walking, and enabling them at the same time to use greater speed," and which the patentee "intends to denominate the pedestrian "curricule."

The machine which forms the subject of this invention consists in the first place of a beam of wood or metal, which is made of sufficient strength to bear the weight of any person who may propose to use it, this beam being mounted horizontally upon two light wheels, one below the front and the other below the hinder part of the beam, the hinder wheel merely revolving upon its axis, but the front wheel not only revolving on its axis but also having "a motion for turning "the carriage by a pivot or axle passing through the beam." A saddletree or seat is mounted above the beam, being supported by screws which pass through the beam, each screw being provided with two nuts, one above and one below the beam, these nuts serving to adjust the height of the saddle from the beam. The person proposing to use the machine sits astride the saddle, and works the machine forward by pressing first one foot and then the other backwards against the ground, whilst at the same time he leans forward and rests his elbows upon a cushion provided for them, and guides the machine by means of a handle connected with the axis of the front wheel

of the machine. The beam may be curved downwards at the part which receives the saddle.

[*Printed, 5d. Drawing.*]

A.D. 1818, December 23.—No. 4322.

RUTHVEN, JOHN. — “An improved drag for coaches, carriages, or other vehicles, which operates by raising a wheel or wheels off the ground, from the inside or outside of the coach, carriage, &c., without stopping the horses.”

The patentee, in describing this invention, first says:—“I attach a chain or jointed iron rod to the perch under the carriage, or the bottom of the body of the carriage, or to any other part which may conveniently be adapted for it, this chain or jointed iron rod to be sufficiently long to reach to the ground, immediately under the axletree of the wheels, and near to one of the wheels; the end of the chain or rod is there attached to the under end of an upright iron rod attached to the axletree, but having a joint in it to admit of being folded up, this upright iron rod having a flat piece of iron on the under end of it, where the chain or jointed iron rod unites with it, being longer than the semi-diameter of the wheel, when dropped to the ground raises the wheel off the ground, and on being folded up drops the wheel; and this is easily accomplished either from inside or outside of a carriage or any vehicle to which it may be attached.”

The invention is illustrated by a drawing annexed to the specification.

[*Printed, 5d. Drawing.*]

A.D. 1819, January 15.—No. 4334.

ROBERTS, JOHN, junior. — “A certain apparatus for preventing stage coaches and other wheeled carriages from overturning.”

This invention consists in the first place of a transverse bar, at each end of which is a spring box with a locker or catch, and in the second place of a “gravitating slider” which is capable of running to and fro upon the bar. The transverse bar is fixed across the coach or other vehicle in a convenient position, the length of the bar being such that the spring

boxes will extend to the full length of the splinter bar. Each box has attached to it a trace or straps of leather, and rolled around it, these straps or webs being carried down obliquely and passed beneath the bodies of the wheel horses and being then connected to those parts of their collars which are nearest to the pole of the vehicle. The spring boxes are so contrived that when not acted upon by the lockers or catches they will keep the straps or traces sufficiently tight without causing inconvenience to the horses, and the action of the whole apparatus is as follows:—"Whenever the carriage is inclined to one side so far as to be in danger of passing the equilibrium and overturning, the gravitating slider before mentioned, which is situated upon the transverse bar, runs along the said bar towards one end in consequence of the inclination thereof, and when it has run a certain distance it operates upon the locker belonging to that spring box which is at the elevated end of the transverse bar in such manner as to lock that spring box fast, so that it cannot turn round or move upon the transverse bar; in consequence the strap cannot unroll from it, but becomes firmly attached to the extremity of the transverse bar, and being also attached to the horse as aforesaid as weight, will act to prevent the coach from overturning. But as soon as the danger is passed, and the coach gets upright, then the gravitating slider will return along the transverse bar to the middle thereof, and will disengage the locker from the spring box, leaving the same at liberty to yield freely, and allow the strap to draw off at every motion of the horse" in accordance with his movements. The details of the invention may be greatly varied, at "the discretion of the workman."

[*Printed, 9d. Drawing.*]

A.D. 1819, April 20.—No. 4360.

SMITH, JOHN.—"Improvements in making arms or axletrees for coaches, carts, waggons, and all other descriptions of carriages."

According to this invention, the arm of the axletree is of less diameter in the middle than at the ends, the bearing taking place for a short distance from each end only. The outer end of the arm is rounded, and bears against the end of

the axlebox in the centre only. There is a collar at the inner end of the arm to prevent the box from leaving its place, this collar working in a recess in the inner end of the box, and there being behind the collar a ring which is secured in its place by long bolts which pass through the woodwork of the nave. Between the collar on the axle and the ring is a thick collar of leather, which not only prevents the collar in the axle from touching the ring when the ring "drifts endways," but also prevents the escape of oil from the box, the inner end of the latter being furnished with rings which penetrate the leather, and the front end being closed, an opening furnished with a screw pin being provided for the supply of oil to the box. If desired, the inner end of the axle box may be rounded inwards to meet the rounded end of the axle arm, or a rounded piece of steel may be introduced into the box for the same purpose. The arm of the axle may either be formed of wrought iron, with hoops of steel welded therein to form the thicker parts, or it may be formed wholly of wrought iron turned to the proper figure and case hardened, and may be furnished with grooves, if necessary, to facilitate the lubrication of the parts.

[*Printed, 6d. Drawing.*]

A.D. 1819, May 18.—No. 4373.

WALL, EDWARD.—"Certain improvements on stage coaches, and other descriptions of carriages."

This invention consists "in an improved carriage body, so arranged that there are two compartments for inside passengers at a distance from each other, and separated by a central luggage box or basket, or a seat or seats for outside passengers, either, or both, or all, in order to distribute the load more advantageously than has before been done over the springs, axles, and carriage. And a carriage body, where two compartments for inside passengers are at a distance from each other, and separated by a luggage box or a basket or a seat or seats for outside passengers, either or both or all being entirely new."

A vehicle constructed according to the invention is set forth by the aid of a drawing annexed to the Specification, in which the body of the vehicle is divided into two compartments,

both adapted for inside passengers, these compartments being separated by a luggage box. Below the body of the carriage are four carved or otherwise formed blocks "to receive the " springs when the body is hung on telegraph springs, or " what are sometimes called cross springs," the patentee stating, however, that as this body is applicable to any kind of springs these blocks may or may not be necessary.

[*Printed, 6d. Drawing.*]

A.D. 1819, September 27.—No. 4398.

BAYNES, JOHN.—Propelling carriages.—The carriage is propelled by means of rods or crutches which are brought to bear upon the ground and to thrust against it by means of levers worked by treadles. The carriage is steered by a hand wheel in front.

[*Printed, 6d. Drawing.*]

A.D. 1820, February 10.—No. 4437.

HUGGETT, JAMES.—"A machine to be attached to carriages " as a substitute for a drag, to regulate the speed, and to prevent accidents in going down hill or in other perilous " situations."

This invention consists " of an apparatus placed under the " carriage, which is intended to act as a drag, by pressing or " rubbing against the ground when going down hill, or in any " situation in which it may be necessary to retard the velocity " of the carriage, by which contrivance very considerable " friction is produced, and the progress of the carriage " accordingly impeded."

An arrangement is set forth in which a drag, consisting of a broad piece of iron, is connected with mechanism by which it may be raised or lowered at pleasure by the turning of a winch, this mechanism consisting essentially of certain shafts and toothed wheels, which when put in motion turn a vertical screw or worm, the latter then moving a cross bar from the ends of which descend arms which, through the medium of a spring, act upon the drag, the turning of the winch in one direction forcing the drag downwards upon the ground, the drag being again raised by turning the winch in the contrary direction. The introduction of the spring prevents the passage

of the drag over rough ground from causing unpleasant jolts to the carriage.

According to another mode of carrying out the invention, a shaft is turned by a winch, and has upon it a spur wheel which acts upon a rack.

[*Printed, 7d. Drawings.*]

A.D. 1820, August 18.—No. 4495.

MILLICHAP, GEORGE.—Axleboxes.—Close to the shoulder of the axletree is a flange to which is attached by screws a frame containing friction rollers; the frame with the rollers consequently forms a fixed part of the axletree. The axes of the rollers fit into radial slots in the frame. Between the rollers and the bearing part of the axle is a loose steel collar, upon which the rollers run. They also run against the interior surface of the axle box, which is accurately bored for the purpose. The rest of the bearing surface of the axle runs in a prolongation of the box. There are cavities for the oil and leather washers make the box tight. A screw cap keeps the axle in its place in the box.

The patentee says :—"The chief novelties and advantages" of the invention "consist in the placing the friction rollers at  
" the back of the shoulder of the axle, and in fixing the frame  
" containing them firmly to the axle, and also in the introduction of the moveable ring or collar between the friction  
" rollers and the axle, and whereby" he conceives that he  
" essentially lessens the strain or friction upon the shoulders  
" of the axles."

[*Printed, 9d. Drawing.*]

A.D. 1820, October 20.—No. 4502.

MAIN, JOSEPH.—Balancing carriages.—The object of this invention is to dispose the weight of the carriage in the best position to ensure stability. In two-wheeled carriages it is to be thrown on to a line in the centre between the wheels. There are various methods shown of accomplishing this object, which depend upon the effect of crossed bars for the result. Any weight placed in such a part of the carriage as would tend to depress that part improperly, is carried by a bar which transfers the weight to another part. Consequently all the up and



down movements of the body of the carriage are parallel, and the whole pressure is transferred to a central bearing bar. The invention is capable of being applied to other than two-wheeled carriages, and a one-wheeled vehicle is also described. By means of these improvements the wheels may be set closer together. An improved axletree is also shown and described. One end is square, upon which one wheel is permanently fixed, the other end is round, upon which the wheel revolves. Thus in turning them there is nothing to prevent one wheel revolving independently of the other. This axletree runs in boxes outside the wheels.

[*Printed, 7d. Drawing.*]

A.D. 1821, April 17.—No. 4551.

MARSH, JAMES HENRY.—“Certain improvements in wheeled carriages.”

In the first part of this invention the boxes of carriage wheels are each so formed as to be of square section inside the axle arm, when the wheel is placed therein, thus only touching the box “in a few places, by this means lessening the friction, leaving the hollow spaces in the corners to hold the grease.” This arrangement may be modified by the box being formed with more than four sides, and the corners being partly filled up, or the interior of the box may incline to a round form, or the interior may be cylindrical, and be provided with longitudinal ribs, these again being either square or round on their inner surfaces. In forming the body of the vehicle, instead of boarding or panneling up the back and upper quarters as usual, a door or shutter is first formed either in one piece, or composed of two or more flaps hinged or jointed together, and then affixed either to the corner pillar, the top rail of the roof, the standing door pillar, or the elbow rail, so as to be capable of swinging upwards, downwards, or sideways, according to the part to which it is connected. Or a light frame of wood may be connected to the main timbers of the back and upper quarters to strengthen them, to which frame the folding doors or shutters may be attached; or “lining” pieces may be used instead of such frame. The roof is formed on the same system as the back and quarters, and may be provided at the edges with thin plates of iron “to keep out the weather,” rabbets and rabbet edges being

used for the same purpose. The folding doors or shutters may be secured in their places when closed by fastenings of the ordinary description. These arrangements may be applied to old vehicles by first removing the upper part which forms the roof, back, and sides. Bent timbers are used for the perches of vehicles, instead of timbers reduced to shape by sawing or cutting, and the transverse plates are reversed by making them stand upright instead of being flat. To the forepart of the body of the carriage are affixed pieces of timber, the upper ends of which rise in a diagonal line, loops being then connected to the fore body by means of an iron stay bolted to the upper parts of these timbers, there being placed on these timbers a square board or a frame, such board or frame having hinged thereto certain parts which constitute the sides and back of a seat when raised, but which may be folded down when not required for use. The invention also includes the use of a folding seat or chair, which may be attached to any part of a carriage, and other details, all of which are fully set forth.

[*Printed, 3d. Woodcut.*]

A.D. 1821, May 17.--No. 4562.

PAUL, ROBERT, and HART, SAMUEL.—“A certain improvement in springs, applicable to various descriptions of carriages.”

This invention consists in a mode of applying several layers or plates of lance or other elastic wood in the construction of springs for carriages. The number of plates employed may be varied according to the quality of spring required, “each plate in succession from the lowest exceeding the other in length. Stops are affixed to the lower side of each plate (excepting the under one), which are made to fit into corresponding stop holes about two inches from the end of each succeeding or inferior plate. All the plates, with the block which supports them, are confined and affixed together by a staple of iron or other suitable material, through which, as well as through the center of the plate, a small screw bolt is driven, or they may be confined and affixed together with two iron clasps near the center, and the screw bolt driven through the center of the plates between the clasps,” this last arrangement being mentioned as more particularly appli-

cable in the case of a crossed or reversed spring, as these springs may be reversed "as is usual in the cross spring of " what is called the Dennet 'gig, but in that case the stop " holes are not pierced quite through the wood, in order that " the wet may be excluded." In order to harden the surfaces of the plates, as well as to protect them from the effects of moisture and friction, they are coated with a mixture of mastic varnish and black lead in those parts which come into contact, this, when dry, being rubbed with a lead weight or some other hard substance, and a mixture of soap, black lead, and oil being then applied thereto. Other compositions of a similar nature may be used instead of those mentioned above. An iron cap is fixed upon each end of the upper plate of each spring, and by means of these caps the springs are connected to the scroll irons.

[*Printed, 5d. Drawing.*]

A.D. 1821, July 17.—No. 4569.

NEWMAN, CHARLES.—"New and original invention in the " construction of the body and carriage of a stage or other " coach, by placing a certain proportion of the outside passengers in the centre of the carriage and a proportion of " the luggage under the same, producing thereby safety to " the coach and convenience to the passengers."

This invention has for its object an arrangement by which the dangerous practice of placing the greater part of the luggage and the whole of the outside passengers of a stage coach either upon the roof of the coach or nearly level with it, is superseded, the outside passengers being provided with a comfortable seat "in the form of a barouche attached to the " back part of the body which contains the inside passengers," the greater number of persons as well as the luggage being placed on the higher wheels, "with the wheels the usual " width on the ground," and the patentee stating that this arrangement enables the vehicle "to travel safer than any " other coach."

According to a drawing annexed to the specification the coachman's seat is arranged as usual, with room for one passenger along with him, there being beneath this seat a small boot for luggage. The body of the coach is arranged

for four inside passengers, as usual, but without any outside seats, the steps being made "to fold over the fore wheels," thus facilitating the entry and exit of passengers to and from the body, without there being any liability of their clothes being soiled by the wheels. The barouche body, which is placed behind the main body, will accommodate eight persons, and is furnished with doors and convenient steps, and behind and extending below the barouche body is a large luggage box, which opens at the back, and is furnished with lock and key, there being upon the box a "dickey seat," capable of accommodating three passengers.

[*Printed, 5d. Drawing.*]

A.D. 1821, July 23.—No. 4572.

VAN HEYTHUYSEN, FREDERIC MIGHIELLS. — Propelling carriages. The patentee says "my invention consists in the  
 "treading round the axletree or spindle into which is fixed  
 "the road wheels of a carriage or paddles of a boat, barge,  
 "or other small vessel. When applied to land carriages,  
 "four arms or more are fixed crossways upon the axletree,  
 "and so placed that the heels of the right and left feet may  
 "alternately tread them down, and consequently turn the  
 "axletree and impel the road wheels forward, by which  
 "means the weight of the body becomes a propelling rotary  
 "power."

[*Printed, 3d. No Drawings.*]

A.D. 1821, July 26.—No. 4575.

BARRY, JOHN RICHARD.—"Improvements in and additions  
 "to wheeled carriages."

For the purpose of facilitating the draught of a vehicle there is fitted to each side an endless rail or shelf upon or against which run antifriction wheels or rollers. These wheels or rollers are carried on the axle arms, outside the bearing wheels of the vehicle. The rollers or wheels on each side are connected by an endless chain. The draught is applied through the rails, and the friction wheels travel round the latter as the vehicle progresses. When travelling over a rough road, the wheels of this vehicle "instead of passing over the obstructions, remain at rest; the carriage nevertheless advances

“ upon the antifriction rollers until the rail has passed beyond  
“ the obstructions, when the wheels rise unimpeded, pursue  
“ their course round the endless railway, and in the order of  
“ succession are again upon the road before the wheels.” The  
axles need not extend from one wheel to another across the  
carriage; each wheel may have a separate axle. For facilitat-  
ing turning it is better to make the carriage in two parts,  
each having a few wheels. The rails of the hinder carriage  
may be rigid, and those of the front section may be made to  
turn on centre or sliding plates, to enable the fore wheels to  
lock.

[*Printed, 8d. Drawing.*]

A.D. 1821, August 14.—No. 4581.

GORDON, DAVID.—Arranging wheels in carriages and propelling. The invention consists “ first, in placing each of  
“ the wheels of the carriage between two horizontal bars  
“ or rails, in such manner that the wheels may be supported  
“ or hung upon bearings or pivots, which pivots may be  
“ adapted to turn round in brasses or collars fixed in the  
“ rails extending on each side of the said wheels. By this  
“ arrangement each wheel is furnished with its own axis or  
“ axle, having pivots formed at both ends thereof, which  
“ turn round in fixed collars (in the same manner as the  
“ wheel of the ordinary wheelbarrow), being entirely inde-  
“ pendent of the other wheels belonging to the carriage.” It also “ consists in the application of an additional wheel  
“ (to a two, three, or four-wheeled carriage), formed like a  
“ hollow roller or drum, which drum may be caused to move  
“ or roll along the road (in order to advance the carriage  
“ forwards), by having a steam or other engine placed within  
“ side of it, in such manner that the engine would tend to  
“ advance or climb up) the inside of the drum, and so by its  
“ gravity to turn the drum round (in the manner of those  
“ machines termed walking wheels, which are used in  
“ cranes, &c.), and would roll it forwards, advancing the  
“ carriage along with it. To effect this, the drum may be  
“ furnished with one, two, or more endless racks, extending  
“ round its inside circumference, into which rack or racks  
“ a toothed wheel or wheels may be made to engage, such

“ wheel or wheels being put in motion by the power of the  
“ engine.” The patentee further says “ I should recommend  
“ the above-described drum to be situated in the frame of a  
“ carriage, in place of the large or hindermost wheels, and  
“ be connected with the frame of the carriage by means of  
“ iron rods or arms, one end of which rods or arms should be  
“ jointed to the axis of the toothed wheels before mentioned  
“ within the drum, and the other ends of the rods or arms  
“ should be jointed or otherwise fixed to any convenient  
“ part of the frame of the carriage, so that the drum on  
“ rolling along would necessarily move the frame of the  
“ carriage with it. The course of a carriage of this description  
“ could be directed by turning the fore wheels round (with  
“ their frame) upon the traverse bolt or bolster, by means  
“ of a rack and wheelwork or other similar contrivance,  
“ whilst the facility of turning might be greatly increased by  
“ making the roller or drum somewhat largest in the middle  
“ (or barrel shaped). The steam engine may be constructed  
“ in the same manner as those engines used for drawing  
“ carriages upon railroads, and may be applied to act within  
“ the drum in various ways.”

[*Printed, 7d. Drawing.*]

A.D. 1821, December 20.—No. 4630.

GRIFFITH, JULIUS.—Steam carriage. The carriage is steered by means of the two leading wheels. They are moved as desired by a hand wheel or lever, working toothed gearing. This gearing puts in motion a vertical shaft fitted at its lower end with a horizontal lever. This lever is in its turn attached to rods which act on the axletree arms and so serve to turn the wheels to the right or left. This fore carriage is attached to the main framing by means of a short perch which is capable of rotating in a socket; so that if by the unevenness of the ground the wheels were inclined, the carriage can still hang vertically. The seat for the steersman is mounted on springs on the fore carriage, near the hand lever. The engine is hung behind the carriage by means of “ four chain  
“ slings with helical springs within them.” The driving motion is communicated to the wheels through gearing so that the turning of the carriage wheels independently of the

engine or their balancing movement on springs, does not affect the machinery.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1822, March 2.—No. 4653.

HIGGINS, JOHN LANE.—Locking carriage wheels. The hind axletree is fixed to a perch extending under the carriage. Near the front end of the perch is placed a cross bar forming part of the perch. This bar lies over the fore axletree. At the ends of the cross bar, at the front end of the perch and again on the perch at a corresponding distance to the rear from the intersection of the cross bar, are placed pins or rollers, which are contrived to work in elliptical or curved slots or racers secured to a frame which rests on the perch. This frame is bolted to the fore axletree and has also attached to it the splinter bar and pole socket. Consequently when the fore wheels are moved either to the right or left in turning the carriage, the frame moves on the four pins or rollers, the pin on the right or left end of the cross bar, as the case may be, forming the centre of motion. The centre of motion being near the wheel towards which the carriage is turning does not oblige that wheel to move much under the carriage and consequently admits of larger fore wheels being used. The arrangement may be modified.

[*Printed, 10d. Drawing.*]

A.D. 1822, March 2.—No. 4655.

THOMPSON, JOHN.—Preparing steel for springs. This invention relates to a method of preparing bars or plates of steel for carriage springs by rolling, instead of by hammering.

A pair of "pointing" rolls are first employed. They have flattened sides with rounded angles which latter only grip the bars and only for short lengths. The use of these rolls is to prepare the ends of the bars for insertion in the tapering rolls.

The latter are excentric rolls, grooved or plain and of a diameter suited to the length of the bar. They approach at their greatest and recede to the maximum distance at their smallest diameter. The bars, when passed through these rolls, are gradually reduced in thickness or tapered. They

are rolled hot, but the inventor finds that by rolling them cold he readily gets rid of the scale.

[*Printed, 9d. Drawing.*]

A.D. 1822, September 3.—No. 4701.

BURGESS, HENRY. — “Certain improvements in wheeled  
“carriages.”

This invention relates more particularly to the bodies of carriages, and is applicable both to private carriages and stage and mail coaches. As regards the latter it is meant more especially to obviate some of the inconveniences endured by passengers in the night, such as the cramped position of the legs, and the annoyance of sitting near to and directly opposite persons of offensive character.

A coach body is described the interior of which is provided with three seats, each capable of accommodating two persons. The occupants of the front part of the body sit with their backs to the horses, while those upon the other seats have their faces to the horses. The hinder part of the body is made deeper than the fore part, and over the deeper portion is a platform on which the two hinder seats are placed, the space below the platform being adapted for the reception of luggage and parcels, a lid or cover being placed in the upper part of the platform, which when closed is secured by means of an iron bar passing from it through the bottom of the coach, below which it is secured by a lock. The middle seat does not occupy the whole breadth of the coach, a small passage being left at each end to give access to the back seat, and the ends of the middle seat being made to turn upon hinges in order the further to facilitate such access. The back and sides of the middle seat extend from the seat to the top of the coach, but a moveable panel or door is placed in the back of the seat in order to allow of communication between the passengers on the middle and back seats when desired. The legs and feet of the persons on the hinder seat occupy the space below the middle seat, a receptacle being formed on the top of the platform for the legs and feet of the middle passengers. The two front passengers descend to their seats from the platform, and have room for their legs and feet between the seat and the platform. These arrangements may be somewhat varied by having only one passenger on the middle seat and two on each



of the others; or each seat may contain three passengers, and be divided into compartments, one for each passenger. The coach is provided with a door at each side, and windows on each side of such doors, as well as in the upper parts of the doors themselves. The outer seats of the vehicle are apparently meant to be arranged in the ordinary manner.

The framework and panelling of the coach may be constructed according to the usual system, but the patentee describes a mode of forming a coach body by putting together three transverse layers of thin planking or veneers of ash or other wood, glued and rivetted together, a layer of thin canvas being placed between the middle and outer layers of wood. The layers are formed to shape on temporary moulds, the latter being afterwards removed; but if desirable two or three pieces of timber may be fixed inside the vehicle, in order more securely to retain its figure, the whole being then finished in the ordinary manner.

[*Printed, 6d. Drawing.*]

A.D. 1822, September 27.—No. 4709.

WHITCHER, JOHN, PICKFORD, MATTHEW, and WHITBOURN, JAMES.—Anti-friction wheels. This invention relates to a new arrangement of friction wheels for the purpose of relieving friction of carriage and other wheels. To the inside of the periphery of the wheel is fitted a ring upon which run a number of friction wheels. These revolve in bearings in another ring concentric with the first. They have smaller wheels on their axes which run on an inner or centre plate which is fitted to the axle of the carriage. The proportions of all these wheels and rings bear a calculated ratio one to another.

There are various ways in which the system can be applied. The inner circle may be attached to the body of the carriage if no springs are needed; or the outer circle may be secured to the carriage and a revolving axle caused to run through the inner circle into an ordinary carriage wheel; or the whole machinery may be put into the nave of a common wheel. An axletree running through the carriage is not absolutely required but a square axletree is recommended for strength. The apparatus should be protected from dust by a casing.

[*Printed, 7d. Drawing.*]

A.D. 1822, September 27.—No. 4711.

PRATT, SAMUEL.—Band for securing luggage, &c. on carriages, &c. The band consists of flat metal links held together by pins or rivets. It is taken up or tightened over the baggage by means of a roller contained in a box and worked by a lever. A ratchet wheel and sliding bolt holds the roller secure in position. This bolt cannot be withdrawn except by the introduction of a proper instrument or key. The keyhole is fitted with a plate to shut out dust. The other end of the chain hooks into the box and is so secured.

[*Printed, 7d. Drawing.*]

A.D. 1822, December 5.—No. 4730.

WOOLLAMS, JOSEPH.—Safety arrangements for carriages. The invention consists chiefly in so uniting the various parts of the vehicle that the shafts and those parts to which the horse is attached, are capable of descending should the animal fall, while the body remains stationary. The descent of the shaft is also retarded by means of springs, in order to assist the animal in recovering its position. In order to free the shafts so that they may descend, a locking pin is lifted out of its place by the contact with the ground of what is termed a “prop wheel,” that is a small wheel held in a frame which also forms the step.

It also consists in hanging the bodies of two-wheeled carriages in pivots in order to allow the shafts to rise and fall without communicating the motion to the body. There are also “sliding or eccentric movements to cause the body and “the parts in connection with it to move forward, or the “shafts or parts in connection with them to move backward, “or both for the purpose of enabling the back of the shafts “to describe an arc of motion when the points descend “without impediment from the boot, hind spring, or other “part of such vehicle.”

It further relates to apparatus for enabling the bodies of carts to tilt backwards when required, in combination with the power of preventing the body coming forward on a depression of the shaft. The part of the framing forming the rear continuation of the shafts is hinged. The cart is attached also by a hinge, to this part. By releasing a trigger this part tilts

backwards and with it the cart. In front of the cart is a "sword" having a "prop wheel" attached to it, which, coming against the ground, sustains the front of the cart. The height of the latter is determined at pleasure by stops on the sword.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1822, December 16.—No. 4737.

DUMBELL, JOHN.—Propelling vehicles. The patentee proposes to substitute feet for wheels; that is to say, instead of putting felloes to the spokes he fits them at the ends with shoes, made either with or without springs acting at the toe and heel. The shoes may be made to move on a pivot or hinge like the action of the human foot.

These "millipedes" are driven by means of tread wheels, and where great power is required the tread wheel is placed longitudinally in the carriage, so as to have greater length. Bevel gearing is used to communicate the powers. Two tread wheels are also used. A horse may be used to steer the carriage or a rudder apparatus may be fitted to two fore wheels or to the "millipedes."

[*Printed, 3d. No Drawings.*]

A.D. 1823, February 18.—No. 4755.

FULLER, THOMAS.—"An improvement in the construction of shafts, and the mode of attaching them to two-wheeled carriages."

This invention is designed to prevent the unpleasant vibration of two-wheeled carriages which is commonly called "knee motion," which object is effected "by rendering the hinder part of the shafts elastic, and affixing them to the drawing bar by means of shackles with pivots, upon which as fulcrums the shafts vibrate, and thereby communicate the up and down motion of the horse to the elastic part of the shaft beyond the drawing bar, while the body of the carriage being suspended in front to the fulcrums and behind to the extremities of the elastic shaft escapes the vibrating action of the shafts, and is subjected to no other motion but that which is communicated by the elasticity of the springs as the carriage passes over temporary obstructions."

The details of the invention may be varied. An arrangement is described, however, in which the shafts are attached to the vehicle by means of certain screws and bolts which may readily be removed and the shafts detached from the vehicle, to which a pole may then be attached "by two sockets "in the centre," and splinter bars for two horses be connected to two of the shackles which usually sustain the shafts. The patentee states that this is "a convenience which has "hitherto been obtained by much additional weight and an "unsightly appearance;" the facility of disengaging the shafts being also an advantage "in shipping for exportation," and other cases.

[*Printed, 6d. Drawing.*]

A.D. 1823, April 16.—No. 4778.

JOHNSON, JOSEPH.—Drags for carriages. The patentee thus describes his invention:—The improvements consist in a method or methods of "letting fall a staff or staves, when "suspended by the upper end to the axletree, near the back "part of the nave or stock, (it may also be applied to any part "of the axletree, perch, or body, to the spring or springs, "shaft or shafts, or to any part of carriages of every description). The other end having a joint or joints by which it "is united to a shoe made of iron or steel, or any other metal "or metals, or wood soled with iron, steel, or any other metal "or metals, which is made to take the ground by certain "methods applied to different parts of the carriage by means "of rollers with a leather strap, line, cord, or chain, or "leather straps, lines, cords, or chains, other suitable material, which is or are attached to a pulley or pulleys, or "without a pulley or pulleys, with or without cog wheels, "having a handle to be used at the pleasure by the proprietor. The said staff, when liberated by the aforesaid means, can "at the pleasure of the coachman, guard, or any person appointed, be let fall, which, when it takes the ground within "the wheel, will lift a part of the carriage off the ground "independent of the wheel, taking the weight of the said "carriage on the side only when it is applied, and will thus "constitute the *drag*. And I further declare that by certain "methods, to be hereafter described, I use a cross bar or bars,

“ or stay or stays, connected with the upright staff or staves  
“ to keep the said staff or staves in its or their upright posi-  
“ tion when in use; and this bar, or these bars, stay or  
“ stays, I liberate at pleasure, and thereby admit of the staff  
“ or staves sliding under the carriage, so that the wheel may  
“ retake the ground, and the drag can then be wound up to its  
“ place ready to resume its action, thereby the drag can be  
“ applied and used to carriages without the person leaving the  
“ place where the pulley or rack is fixed.”

[*Printed, 10d. Drawing.*]

A.D. 1823, November 1.—No. 4855.

RANKING, JOHN.—“ The means of securing valuable property  
“ in mail and other stage coaches, travelling carriages, wag-  
“ gons, caravans, and other similar public and private vehicles  
“ from robbery.”

This invention relates to a mode of giving notice of the opening of the door of the boot or luggage box of a coach or other vehicle, so that if such door should be opened for an improper purpose attention will be directed thereto. The apparatus employed consists of a bell which is mounted upon an iron plate inside the boot or box, a curved spring, to which a hammer is connected being also secured to this plate, the hammer, when at rest, being at about a quarter of an inch distance from the bell. The latter is partly covered by an iron casing. To the lock which is attached to the door of the box or boot a strong spring latch is connected, this latch being so arranged that on shutting the door the bevilled end of the latch passes beneath a part of the bell spring, which is also bevilled, and remains close under it, “ so that on the least  
“ opening of the door the latch lifts the bell-spring, the  
“ hammer of which strikes the bell.”

[*Printed, 5d. Drawing.*]

A.D. 1824, January 24.—No. 4895.

BEWLEY, THOMAS.—Improvements in the construction of carriages. Part of this Specification is devoted to the description of an improved mail coach. The coach is entered from the rear, and is fitted to carry both inside and outside passengers, the latter sitting as in an Irish “inside” car. In front

of the coach and behind the driving box, is a kind of chamber large enough to hold two guards. It is entered from the front and the sides are closed in so as to afford protection in case of attack. Loopholes are made in the sides for the purpose of enabling the guards to fire their pistols, and the top lifts up on a hinge to enable them to use blunderbusses and like larger weapons. The mails are carried in a boot under the main body.

There is also a bar placed across the under part of the coach body and extending on each side to support the coach in case of a wheel coming off.

The coach has three wheels, one in front under the fore carriage and two main wheels. Each of the latter has its separate axle working in bearings under two side bars upon which rest the springs. Each wheel has two springs, one to each bar. The ends of the springs are coupled by iron bars and are attached by scroll irons to the coach body.

The axles of the wheels work in boxes, the bearings being made of stone or other like material. The bearing rests on the axle; under the latter is a wheel pressed against it by a spring and revolving in oil, which is thus supplied to the axle. Guards are supplied to prevent escape of oil and also to prevent derangement in case of a sudden jerk.

[*Printed, 1s. Drawings.*]

A.D. 1824, February 19.—No. 4904.

ISAACS, MOSES.—Wheels and preventing overturning. The spokes are curved and made of any elastic material. They are “fitted to the nave at the back quarter by means of “grooves, two hoops being fitted on the nave, one on each “side, in order to keep the springs in their proper places; “the axle is fixed in the nave, and made to revolve in a cap “or cover attached to the carriage.”

To prevent overturning a rod is used made with teeth or notches and “fitting into a case or tube,” at the bottom of which “there are one or more springs to prevent the rod re- “turning after it has fallen. This rod and case or tube are “suspended near the top of the carriage by means of a “knuckle joint or hinge.” The patentee also makes “use of “a bar to prevent the carriage proceeding after the rod or

“ case has fallen, which is fixed on the front of the hind axle  
“ or other convenient place, and is kept up by a rod passing  
“ under the coach from the case or rod ” before mentioned.

[*Printed, 6d. Drawing.*]

A.D. 1824, May 15.—No. 4957.

JAMES, WILLIAM HENRY.—“ An improved method of constructing steam carriages, useful in the conveyance of persons and goods upon highways and turnpike roads without the assistance of railroads.”

This invention consists essentially “ in adapting separate engines to the gear of each of the wheels on which the carriage runs, instead of actuating them all by one engine as heretofore. These engines are of small dimensions, and are intended to be worked at high pressure, having their steam supplied by pipes connected with a boiler or generator situate in any convenient part of the carriage,” the patentee stating that by means of this arrangement he is enabled “ to vary the powers communicated to the respective wheels, and give to each a motion independent of any of the other wheels, so as to cause them to turn with different velocities, which is essential in moving the carriage in curves, or turning corners in the road. This is effected by slide valves or stopcocks opening or closing the apertures through which the steam passes to the respective cylinders, and these valves are worked either with levers by the conductor or engineer, or by rods connected to the fore axletree, which, as it is turned upon its centre, is made to open or shut the slide valve or stopcocks,” as requisite, and in some cases the steam may be shut off from the cylinders of one or more of the wheels, thus causing such wheel or wheels to act as a drag, and so retard the progress of the carriage. The details of the invention may be varied.

[*Printed, 7d. Drawing.*]

A.D. 1824, October 14.—No. 5017.

GUNN, JAMES.—Improvements in coaches. The first of these improvements relates to a new arrangement of the framing of the coach body, by which the timbers may be placed edgeways for the sake of lightness, and by the disposition of the bed or

framing more room is afforded to the inside passengers. The back of the step shuts up against the lower part of the door and when water has to be passed through it is let down and a sheet of iron slipped into grooves made for the purpose, by which means entry of water into the coach is prevented. The door may also be made to open from the rear, by which arrangement the coach may be brought lower.

By one improvement the boot supplies the place of the under carriage fitted at the upper side or top, with circular grooved locking plates, friction rollers and lubricators. Methods are described of strengthening the boot against thieves and of locking it. Plates of iron are inserted which revolve against any cutting or boring tool like a centre bit. An alarm is also described; also a special strong box for bankers' parcels.

The improvements also relate to the axles and axletrees. The latter may be hollow for strength and lightness and the axletree arms may contain oil. Improved methods of fitting the axle boxes are shown, which cannot well be described without the drawings.

The wheels are strengthened by a combined tire and stakes; and the joints of the felloes may be secured by iron plates. In order to skid the wheels, studs or hooks are fitted on each side of the felloes which may engage with the claw end of the drag, a chain or bar attached to the carriage.

The springs are arranged as follows. On the axletree or bed is fixed a cross spring equal to the extreme weight to be carried. On each side of the axletree or bed are fixed the eyes of a second and third spring, more elastic than the former, and which are suspended at or near the centre from the eyes of the cross spring by shackles. The body is then attached to the extreme ends of the second and third springs. "From the eyes of the cross springs, or from the second and third springs, at their suspension from the same, are fastenings to ironwork, which is attached to the boot and body of the vehicle. They act in the following manner, viz., when the second and third springs are overpowered, the ironwork and fastenings come into action on the cross springs, and consequently place on them the principal weight."

[*Printed, 7d. Drawing.*]



A.D. 1824, October 21.—No. 5024.

HARRIS, GEORGE SAMUEL.—“ A machine for the purpose of  
“ giving the most effectual and extensive publicity, by day  
“ and by night, to all proclamations, notices, legal advertise-  
“ ments, and other purposes to which the same may be  
“ applicable, destined for universal information, and which  
“ will henceforward render unnecessary the defacement of  
“ walls and houses in the metropolis and its vicinities by  
“ bill-sticking, placarding, and chalking, which latter prac-  
“ tices have become a great and offensive public nuisance.”

This invention consists in the employment of a machine or lantern which may be of cylindrical, octagonal, or any other convenient shape, and be composed of slight framings of metal, wood, or other material, arranged in such manner as to form a number of openings or panels, adapted to receive the bills or notices which it is desired to proclaim or advertize. This machine is mounted upon a carriage, being connected to the bed of such carriage by means of a bolt or axis on which it is capable of revolving, so as to exhibit every part of its surface in succession to the spectators, lights being placed inside the machine in foggy or dark weather, or at night, so as to render the notices legible in the manner of transparencies. The details of the invention may be varied, but an arrangement is set forth in which a machine or lantern is mounted upon the bed of a carriage having four wheels, and arranged so as to be drawn by a horse, the machine or lantern being turned slowly round as requisite by a person travelling with the vehicle.

[*Printed, 6d. Drawing.*]

A.D. 1824, December 18.—No. 5056.

GORDON, DAVID.—Propelling carriages. The propulsion  
“ is performed by the operation of a number of rods or pro-  
“ pellers, which rods or propellers are attached at one end of  
“ their extremities to a like number of cranks situated upon  
“ one common axis across the carriage near to the hind part  
“ thereof, whilst their outermost extremities are formed so  
“ as to be capable of seizing the ground in a sufficient degree  
“ to propel or drive the carriage or other machine aforesaid  
“ forwards, being at the same time connected by rods or

“ cords with the extremities of certain levers, which are  
“ operated upon by an equal number of excentric shapes or  
“ wheels, the said excentric wheels being all fixed upon one  
“ common axis, receiving its rotary motion by a pair of equal  
“ cog wheels from the main crank axis. By the said arrange-  
“ ment, as the crank axis and excentric wheel axis are caused  
“ to revolve with equal velocity by any adequate power  
“ applied to them, the rods or propellers aforesaid will be  
“ forced or thrown out backwards (or in the contrary direc-  
“ tion to that in which the carriage is desired to be moved),  
“ and by the form or shape of the excentric wheels the outer-  
“ most extremities of the propellers will only remain in  
“ contact with the ground at the time when they are moving  
“ with the greatest velocity, or nearly so; at other times the  
“ extremities will, by the action of the excentric wheels, be  
“ taken up entirely off the ground. Thus a continuous  
“ action will be kept up to propel the carriage or other  
“ machine or implement forwards.” The inventor claims  
“ the right of employing bristles, whalebone, or other  
“ pliable material, affixed to the under surface of the curved  
“ feet of the propellers, as a substance to come into contact  
“ with the ground, and hold sufficiently thereupon.”

[*Printed, 10d. Drawing.*]

A.D. 1824, December 18.—No. 5060.

SNOWDEN, WILLIAM FRANCIS.—Propelling carriages. Part of this invention relates to the propulsion along a road of a carriage in two storeys. Upon the lower storey is placed horse gear, which on being turned by horses moving in a circle, communicates movement through gearing to a toothed wheel which takes into a rack placed on the road. The upper storey of the carriage is capable of being elevated or depressed at each end, by means of a screwed prop or pillar for the purpose of maintaining a level in ascending or descending hills.

Another part relates to a carriage similarly worked by horses, but without the assistance of the rack on the road. The gearing drives the axles of the wheels, and the latter though loose on the axles, are compelled to revolve in one direction with the axles, by means of palls and ratchets. For

steering, the axles are placed in oblique positions by a handle and worm. The hind axle is connected with the leading axle by rods.

The inventor makes the "rim" of the wheels of wood by "placing a series of blocks or pieces side by side, and attaching them together, so that the grain of the wood shall radiate from the centre to every part of the periphery." These blocks are not bound together by a tire but by side rings of iron; so that the wood surface runs on the ground.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1824, December 24.—No. 5063.

STAFFORD, DANIEL. — "Certain improvements on carriages."

According to the first part of this invention certain iron frames or supports attached to and rising from the beds and axles of a carriage sustain certain springs, there being at the upper parts of the latter certain racks, and there being in gear with these racks other racks which are attached to the body of the vehicle, the arrangement being such that "if from any unevenness of the road the carriage part of the vehicle should be tipped to one side or the other the body will still preserve its equilibrium by adjusting itself by means of its own weight on the two racks," a certain rod, passing under the perch, being so shaped as not to prevent the swinging of the body, but being so placed as to prevent any sudden jerk from raising the body so high as to throw the teeth of the racks out of gear.

Another part of the invention relates to apparatus which is meant "to be attached to the axle of a carriage, which serves the purpose of a second axle, and also to keep on the wheels," this apparatus consisting of certain arms which are jointed to the axletree and keep in place certain grooved plates, the latter receiving projections from certain caps which are screwed to the naves of the wheels. And another part of the invention relates to an improved axle box, and consists "in making the said box with a triangular-shaped bore, or a bore of many sides instead of round, as is now in use, by which means much friction will be prevented."

[*Printed, 8d. Drawings.*]

A.D. 1825, February 3.—No. 5090.

BURSTALL, TIMOTHY, and HILL, JOHN.—Steam carriage. The boiler, with its furnace, especially designed for the purpose of raising steam speedily, is suspended by springs from a platform at the rear of the vehicle. On the platform are the driving engines. These are of what is generally known as the “grasshopper” type and the steam is supplied to them through a pipe coiled on itself, by which arrangement sufficient elasticity is secured to allow for the movement of the springs. The water is carried in a tank under the body of the coach. This tank is constructed to bear a high pressure and the water is forced from it to the boiler by means of air compressed into it by pumps worked by the engines. The engines drive the hind wheels through cranked axles. These may be made in two parts if desired, the cranks being kept in relative position by quadrants. The hind carriage is attached to the fore carriage by a joint and perch. The fore carriage has a pair of wheels through which the vehicle is steered by means of a toothed segment and gearing worked from the front. If necessary the power applied to drive the hind wheels, may also be communicated to the front wheels by means of a shaft, with an universal joint, worked by bevel gearing from the hind axle. Clutches are adapted to all wheels so that in turning the wheels are enabled to adapt their rotation to the curves and brake bands are fitted to the naves. A blast may be applied to urge the fire.

[*Printed, 10d. Drawing.*]

A.D. 1825, April 12.—No. 5148.

BRANDLING, ROBERT WILLIAM.—Carriages and tramways. Part of this invention relates to the construction of a railway upon which carts may travel and, at pleasure, leave for the common road. It also relates to wheels which may be “single, double and triple tyred,” that is have their tires so arranged as to produce different patterns of tread and flange. There is also a spring scraper. Shafts have hinged or flexible joints to prevent the vehicles being drawn off the line and shafts may be fixed at each end of the vehicle. A train of carriages may be made up by joining them by hinged bars.

[*Printed, 5d. Drawing.*]

A.D. 1825, April 28.—No. 5157.

RYDER, SAMUEL.—Attaching carriage poles. A frame of iron is constructed to be fitted between the futchels, in which position it is secured by bolts and nuts. The centre of the rear end of the frame is pierced so as to form a conical socket. The front end, which lies in advance of and below the splinter bar is formed of two bars, the top being arched, between which bars the pole is inserted. The foot of the pole is fitted with an iron shoe, the point of which fits into the socket at the rear end of the frame, while at the part of it which fits into the front part of the frame there is on each side a wing or bracket to interlock with corresponding recesses in the frame. The pole being inserted in the frame is secured there by a screw pin passed downwards through the arched top of the front of the frame into the pole.

A modified arrangement is shown, in which the screw pin secures the pole at the point, the above mentioned wings and recesses holding the pole securely in front.

[*Printed, 10d. Drawing.*]

A.D. 1825, May 10.—No. 5160.

HILL, THOMAS, the younger.—Carriages for tram and other roads. This vehicle is supported upon four wheels. The door for passengers is in rear, luggage being fixed in at the sides near the front of the carriage. The seats run longitudinally and are over the wheels. The latter are of wood and iron and have moveable flanges attached by bolts and nuts. The fore wheels turn round a main bolt in the under carriage and a contrivance is shown for keeping the wheels “in a straight-forward position upon the railways.” When the carriage is running on the rails the shafts are connected with it simply by an eye bolt which runs on an iron rod “according to the swerveing of the horse.” On ordinary roads two loops on the frame of the carriage serve as attachments.

[*Printed, 9d. Drawings.*]

A.D. 1825, May 14.—No. 5165.

PYKE, THOMAS.—“A machine or apparatus to prevent the overturning or falling of carriages.”

According to this invention there is suspended outside each hind wheel of the carriage, coach, or other vehicle a "pendulum," or bar of metal, which is supported by other bars the lower ends of two of which descend to a "saddle" by which they are connected to the hind axle of the vehicle, while the other parts of these bars are curved outwards so as to pass over the springs and the wheel, and keep the pendulum at a certain distance from the latter, a third bar being connected with these and then carried downwards and backwards and connected to a corresponding bar proceeding from the apparatus on the other side of the vehicle. The pendulum hangs from a pin or bolt which passes through the upper ends of the two curved bars, this pin also passing through the upper ends of certain bow irons or bent bars the lower ends of which are fastened by means of a clip to the pendulum, to which these bow irons act as stays; a diagonal stay iron and a horizontal tie bar being also employed in strengthening the two curved bars already mentioned, and a cap or cover being applied over the parts of the latter from which the pendulum is suspended, in order to protect those parts and the mechanism connected with them from being injured by the feet of passengers or otherwise. The lower end of the pendulum is provided with a small wheel, and the result of the whole arrangement is that on the vehicle leaning either to one side or the other beyond a certain extent the pendulum on that side would swing outwards, and the wheel at its lower end come in contact with the ground and run thereon, the vehicle being thus prevented from overturning. The pendulum is slightly bent at the lower part so as to prevent the wheel "from running back," and suitable arrangements are made to prevent the pendulum itself from moving too far either outwards or inwards. An apparatus of similar character, but of lighter and more simple construction, is described as being suitable for a gig or other two-wheeled carriage, bent springs being here employed "to prevent the gig from falling back on ascending a hill," such springs being attached to the shafts and the latter being made in two parts which are hinged together, this part of the arrangement being intended "to prevent the falling of the horse from injuring the gig."

[Printed, 7d. Drawing.]

A.D. 1825, May 14.—No. 5170.

GURNEY, GOLDSWORTHY.—Propelling carriages. This invention relates to a method of propelling wheeled carriages on common roads by means of crutches or feet acted on by power. Each of these feet is fitted at the top with a friction roller apparatus which runs in grooves constructed in a perch or rail running longitudinally under the carriage. Consequently when the power of the steam engine is applied by means of levers to these crutches or feet, the carriage rolls over the upper ends of them during each stroke or step. The feet are attached to the roller boxes or apparatus by a spring joint to allow for inequalities of the road and to facilitate adjustment. By varying the lengths of the connecting levers the force of propulsion is increased or diminished, the carriage is steered by the action of an endless chain on a rigger affixed to the axletree of the hind wheels between the rails constituting the perch of the carriage.

[*Printed, 7d. Drawing.*]

A.D. 1825, June 14.—No. 5185.

LINDSAY, JOHN, Honourable.—Roads and wheels. This invention chiefly relates to the construction of tram and other roads, but it also provides for the use in carriages intended to run upon such roads, of a wheel having cogs upon it as well as an ordinary tread. The cogs run on a toothed way in order to facilitate propulsion, the ordinary tread of the wheel running upon the road pitching.

[*Printed, 7d. Drawing.*]

A.D. 1825, June 18.—No. 5188.

MASON, WILLIAM.—“Certain improvements on axletrees.”

This invention consists in the employment of “a peculiar kind of screw nut” along with a “check washer” to the end of an axletree, “whereby any required play may be given to the wheel without danger of losing the nut,” and also in the use of a cast iron axle box, which is furnished with straight longitudinal cavities for the reception of oil and its distribution over the arm of the axletree.

An arrangement is described in which a screw of much less

diameter than the axle arm projects from the outer end of the latter, a semicircular groove passing along one part of this screw. The screw is provided with a suitable nut by which the "collet" is retained upon the axle arm, and in this nut are semicircular grooves, each corresponding with that in the screw. When the nut is placed upon the screw a washer is placed behind the nut having a pin projecting therefrom which is made to enter the cavity found by the groove in the screw and that groove in the nut which is opposite to it, the nut being thus prevented from turning round in either direction, and the washer itself being retained in its place by a smaller screw with a large head which is inserted into the end of the axle arm.

As regards the axle box the essence of the invention is set forth in consisting in a box of cast iron having cavities for oil formed in it at the time of casting.

[*Printed, 6d. Drawing.*]

A.D. 1825, June 21.—No. 5194.

CORBETT, Ross.—“A new step or steps to ascend and descend from coaches and other carriages.”

This invention relates to a step or steps by which access may be obtained to and from the inside as well as the outside seats of coaches and carriages, and consists in the first place in connecting the steps used for ascending to the inside of the carriage with the door, and so as to be turned down and folded by the opening and shutting of such door, thus enabling a traveller to enter and leave a vehicle without the assistance of an attendant. The steps are mounted on pivots in a fixed frame which projects downwards and slightly outwards below the door of the vehicle, the steps being capable of turning on their pivots, so as either to be brought into a horizontal position for use, or raised into an almost vertical position within the frame, the latter being furnished with a back covering of leather by means of which the steps are kept clean when not in use. In order to raise and lower the steps a horizontal rod is jointed to the door, this being connected through the medium of a lever and another rod to a bell crank hung in a fixed bracket, and having proceeding therefrom jointed rods which are connected to levers attached to the



steps, the result of the whole arrangement being that on the door being opened the steps are pushed downwards, while on the door being again closed they are raised into the frame, as already mentioned.

In the other part of the invention, which relates more particularly to steps for giving access to the outsides of vehicles, the arrangements are of similar character, the steps being here actuated, however, by a "handle lever," instead of by a door.

[*Printed, 7d. Drawings.*]

A.D. 1825, July 16.—No. 5216.

COOK, THOMAS. — Controlling horses. For the purpose of "causing the horses to exert their strength in contributing to control," various modifications of one general form of apparatus are used. Straps or chains connected with the bits of the horses, are brought to the axletree or to winding apparatus connected therewith. In one form a bevel wheel on the nave works a ratchet wheel which winds up the straps when the apparatus is thrown into gear by the driver or other person having control thereof. Overwinding is provided against by automatic apparatus.

[*Printed, 1s. 5d. Drawing.*]

A.D. 1825, August 11.—No. 5235.

HIRST, WILLIAM, HIRST, HENRY, HEYCOCK, WILLIAM, and WILKINSON, SAMUEL. — "Certain apparatus for preventing coaches, carriages, mails, and other vehicles from overturning."

This invention consists essentially "in fixing to the top of the coach, carriage, mail, or other like vehicle, a proper support, which so long as the said vehicle maintains an upright position, remains close to its side, but as soon as it inclines beyond a certain point to one side or the other flies out from the said vehicle into a perpendicular line and supports it."

An arrangement is described in which a coach has suspended from the top, on each side, an iron frame, having at its lower end a wheel. Springs are so arranged as to tend to press the frames constantly outwards from the coach, but are restrained

from so doing, except the apparatus is required to act, by catches, with one of which the lower part of each frame is furnished, and which catches during the ordinary progress of the vehicle, take hold of certain horizontal bars or levers mounted in suitable bearings. From one end of each of these horizontal bars rises a vertical bar, the top of which is formed into a catch, and enters a hole in the bottom of a long box which passes across the top of the coach, catching or holding upon the side of such hole, and the vertical and horizontal bars being thus kept in a raised position. The bottom of the box is deeper in the middle than at the ends, and in the box is a heavy ball, which so long as the coach retains its ordinary position remains in the centre of the box, but on the coach leaning dangerously to one side runs to the end of the box on that side, disengages the upper end of the vertical bar and allows that and the horizontal bar connected therewith to fall, the horizontal bar then liberating the catch of the frame on that side and allowing the springs to throw that frame outwards, when the wheel of that frame coming into contact with the ground will prevent the coach from overturning, another catch then keeping the frame in its outward position. Instead of the ball and box a pendulum may be used.

[*Printed, 6d. Drawing.*]

A.D. 1825, October 13.—No. 5267.

EASTON, JOSIAH.—Steam carriages, &c. This invention relates partly to the construction of vehicles for ascending inclines, and secondly to the construction of tramroads. A rack may be laid in the centre of the road with which a pinion carried by an elevating and depressing frame on the carriage engages. This pinion is driven by power. Horizontal guides or pressure wheels may be also used, to grasp the sides of a central rib or rail. To tow carriages on the improved tramroad, the pole of the carriage projects laterally, so that the horse walks on a kind of tow path at the side of the road.

[*Printed, 9d. Drawing.*]

A.D. 1825, November 7.—No. 5279.

SEATON, THOMAS.—Constructing carriages and wheels, &c. The body of the carriage or waggon, is constructed of a system

of diagonally placed or lattice-worked bars of wood or metal, secured at the intersections and to uprights, which latter fit into mortices in the bed pieces. Near the lower ends of the uprights are mortices into which are fitted horizontal bars, which support the floor of the waggon. The bed pieces are rectangular boxes of metal strengthened internally at intervals by blocks of metal and externally by bands.

The wheels are of iron, the spokes being springs of oval shape and are either arranged in single or double series. The naves are of cast iron or other suitable metal, into which the inner ends of the springs are secured. The naves may be cast on the axles or otherwise secured. The latter work through the centres of the blocks placed inside the above described bed pieces and they are secured by means of grooves at those parts where they run in the blocks, and garter pieces.

The circular locking plate is shown. There are two hooks fixed to the upper fore-bed of the carriage which pass under the locking plate and serve to prevent the carriage rocking on the lower bed.

The patentee claims that by this method of construction of carriage concussion is diminished.

[*Printed, 10d. Drawing.*]

A.D. 1825, November 7.—No. 5280.

HUNTER, GEORGE.—Wheels. This invention chiefly relates to various modifications of a system under which each of the wheels of the vehicle runs inside the periphery of a larger wheel, the latter thereby forming a rail or tram for the carriage wheel to progress upon. Under some of these modifications the large wheels have rails or ribs, the smaller corresponding grooves. In another form the inside of the larger or "road" wheel is flat and the carriage wheel is confined to its place by side pieces on the "road" wheel. These wheels may be of metal or partly of metal and partly of wood.

An arrangement is also shown for turning the carriage without causing the fore wheels to move under the carriage and thereby enabling them to be made as large as the hind wheels. Instead of pivoting the axle at its centre, it is attached to the end of an arm at right angles to it. This arm is pivotted at its centre, and steadied at the end farthest from

the axle. Consequently the axle turns at some distance from the centre of motion.

[*Printed, 10d. Drawing.*]

A.D. 1825, November 8.—No. 5281.

BRANDRETH, THOMAS SHAW. — “An improved mode of constructing wheel carriages to be used upon railroads, or for other similar purposes.”

This invention consists in the first place in fixing the hind wheels of a railway carriage upon an axle in the ordinary manner, and then placing upon this axle a second axle on which are two “friction sheaves” having flat faces, these sheaves resting upon the axle of the bearing wheels, and sustaining the body of the carriage, such sheaves running upon the lower axle, between the naves of the wheels and certain inside collars. The axles of the sheaves and of the bearing wheels work in bearings which are supported in slotted brackets, projecting downwards, and connected at the lower ends with stays placed diagonally, the latter being connected at their upper ends by tie bars placed horizontally, and forming the main supporting beams of the carriage; being fastened by means of flanches to wooden cross beams, upon which the floor of the carriage is laid. As regards the front wheels of the carriage the arrangement is similar, with the exception of there being in this case **only** one friction sheave, which rests upon the middle of the lower axle, working between two collars thereon. The sheaves are formed of iron, cast in iron cases or moulds, which gives smoothness and hardness to their faces, and the latter may, if preferred, be slightly rounded, so as to prevent the sheaves from “running on an edge,” and the axles of the sheaves work in bushes of brass or soft cast-iron, which are so arranged as to have a slight amount of play in the bearing. Several advantages are mentioned as arising from the use of these bushes, and the parts of the invention mentioned above may all be applied to locomotive engines as well as to carriages. The carriage body may either consist of a mere frame or platform on which may be placed bales, bags or boxes of merchandise, or it may be composed of two boxes, “open to each other in the middle,” and connected at the top by hinges, and at the bottom by bolts and shackles; one box

resting upon the front and the other upon the hind wheels of the vehicle, and being capable, on the removal of the bolts and shackles, of separating at the lower parts (the framework being so arranged as to separate with them) and allow of the discharge of the load into a vessel or receptacle beneath, the parts being prevented from receding from each other too far by means of certain chains or jointed rods. The patentee mentions that this mode of constructing the body of a carriage, "though new," he does not claim as being included in his patent, and also that the invention "is applicable to tram roads and other similar roads, though less beneficially than to railroads."

[*Printed, 5d. Drawing.*]

A.D. 1825, December 3.—No. 5301.

POPE, WILLIAM.—"Certain improvements on wheeled carriages."

This invention consists mainly in the application to a carriage of what the patentee terms a "detached or revolving hinder axletree," which is fitted to a second bed," and attached to the first or ordinary bed by "a revolving spindle," the arrangement in fact consisting in the employment of a hind axle from the centre of which a horizontal spindle projects, this spindle passing through a socket attached to the ordinary bed and also through an eye connected with the perch, the intention of the arrangement apparently being that the axle may turn to some extent in the socket and eye when the wheels are passing over uneven ground, there being in the "second bed" certain stops, "to receive, catch, or stop the other part of the carriage when it is raised on either side to a degree of danger," the parts being, moreover, strengthened if necessary by the application of certain plates and bolts. In applying the invention to an old carriage the springs "remain on the old bed," and the additional axletree may be cranked if desirable, "to bring the load nearer the ground." The patentee states that he occasionally makes use of the ordinary currie bar, but arranged in such a manner as to become a fixture with the pole of the carriage, the bar resting on the horses' backs, "to stop or prevent the upsetting of the carriage." In two-wheeled vehicles the ends of the

shafts are secured to the horse's shoulders by bringing braces round the animal's fore legs close up to the breast, "to keep the ends of the shafts from shifting or rolling round."

[*Printed, 5d. Drawing.*]

A.D. 1825, December 14.—No. 5310.

ADAMS, ROBERT.—"Method of propelling or moving carriages of various descriptions on turnpike, rail, or other roads."

[*No Specification enrolled.*]

A.D. 1826, January 23.—No. 5325.

STEPHENSON, ROBERT. — Axles. The object of this invention is to facilitate the passage of curves by giving to each wheel an independent motion. Each wheel is attached to a separate axle which extends across the carriage and at the other end is fitted with a ball and socket bearing. The wheel end runs in a vertical slot to allow a certain freedom of play.

[*Printed, 6d. Drawing.*]

A.D. 1826, May 23.—No. 5366.

BIRT, THOMAS PARRANT.—"Certain improvements or additions to wheeled carriages."

This invention "ensures the safety of the passengers from accidents by overturning the coach, the equilibrium being preserved by stowing the whole of the luggage at the bottom of the vehicle instead of placing it upon the roof agreeably to the mode at present universally adopted." By a novel mode of constructing the carriage "the inside passengers sit higher than the outsides, and all have their faces towards the horses. The outside passengers sit before the inside in that part which was formerly considered as the body of the coach, and are by that means placed four feet lower than they are in the common stage coach; the luggage is placed beneath them in the bottom of the coach." The invention also includes "a new method of dragging the wheel on either side by a very simple and easy process. A small lever is fixed to the boot which is connected to a skid iron fixed on the hind bed by means of a shaft, with a spring

“ attached to it, which acts immediately the lever is thrown  
“ off and places the skid under the wheel, where it is detained  
“ until by an application of the driver’s hand to the lever, it  
“ is released instantaneously.”

Another part of the invention relates to the arrangement of the splinter bar, “ it working on a swivel from the centre of  
“ each horse’s draft affixed to the main bar,” various advantages being mentioned as arising from this arrangement. The “ draft of the carriage being from the spring ” is mentioned as another advantage, but it is not clearly set forth how this part of the invention is effected.

[*Printed, 5d. Drawing.*]

A.D. 1826, May 23.—No. 5371.

SLAGG, RICHARD.—“ An improvement in the manufacture  
“ of springs, chiefly applicable to carriages.”

This invention consists “ in rolling steel for making carriage  
“ springs by grooved rolls, made convex in the bottom of the  
“ groove, so as to make each side of the bars of steel concave,  
“ also with horizontal rolls (not hitherto used) to keep the  
“ edge of the bars of regular thickness; by which means the  
“ spring is less liable to get out of order, and it also saves  
“ much labor and time to spring makers by giving a con-  
“ cavity to the bar which has hitherto been forged by the  
“ hand.”

[*Printed, 3d. No Drawings.*]

A.D. 1826, August 2.—No. 5400.

WRIGHT, SAMUEL WELLMAN.—Trucks for removing casks, &c. These improvements in the construction of trucks are intended to facilitate transmission of casks and other heavy packages in warehouses and other places, where such articles may be required to be piled one on the other or taken down and removed.

The invention consists in fitting the truck with a skid upon which the cask or other object is to rest. This skid is elevated from the truck and lowered upon it by means of levers worked by chains and pulleys, or by rack gearing. If it be required to take down a cask from the top of other casks, the

skid is raised to a level with it, after which the cask is hauled on to the skid by a chain and screw gearing attached to the truck. By working a handle the skid is then lowered on the truck and the latter may then be moved with its burden. Similarly casks may be lifted into their places and stacked. A loose skid is sometimes added to facilitate loading from or unloading on to the ground. Various modifications of the invention are shown.

[*Printed, 2s. 6d. Drawings.*]

A.D. 1826, August 22.—No. 5405.

BUSTALL, TIMOTHY, and HILL, JOHN.—Propelling carriages by steam power. These improvements consist firstly in supporting the boiler on a third pair of wheels, in order that it may be as far removed from the carriage as possible. For good roads it is proposed to support and bolt the back end of the boiler on the axle, and the end next the engine or fore end on a centre pin fastened to the engine frame, “by which it is “drawn on a forked perch.” On bad roads where springs are necessary, the boiler is put into a frame fitted with springs hung on the before-mentioned pin and bolted into the axle. In the case of a vertical boiler it is put into a frame which hooks on to the rear end of the engine frame and has a pair of wheels at the rear. The latter with their axle, swivel on a pin fitted to the frame.

The improvements also relate to a flexible joint in the steam pipe between the boiler and the engines.

The propulsion is effected by means of cranks working toothed wheels which engage with other toothed wheels in the axles, the latter are loose on the axles but are put into driving gear by means of a sliding clutch. The toothed gearing is proportioned according to the speed and power.

The carriage is steered from the front by means of a pitch chain passing round pulleys in the front and connected at the two ends with the ends of the front axle tree. The latter is pivotted to the end of the perch. The springs are under the platform of the conductor instead of being under the seat.

[*Printed, 10d. Drawing.*]



A.D. 1826, October 11.—No. 5415.

JONES, THEODORE.—Wheels. This invention consists in so constructing wheels that the weight of the carriage is suspended from the upper part of the wheel instead of being supported by the spokes upon the part on the ground. The spokes or suspending bars have conical heads fitting into countersunk holes or mortices in the felloes and tire of the wheel. Their other ends are screwed and fit into cells cast or otherwise constructed in the nave, where they are tightened up by nuts. Various forms of wheel are shown, with single and double rows of spokes.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1826, October 18.—No. 5420.

VINEY, JAMES, and POCOCK, GEORGE.—Propelling carriages by kites. “This Patent is obtained for an invention by which kites are made to act as endyant sails, for the purpose of navigating or drawing vessels or drawing carriages.” “The peculiarities of these kites are :—First, they are rendered portable by folding up, there being joints in the wings, and also in the standard. Second, there is a moveable distender, by which the wings are spread. Third, they have four lines by which their power is controlled or their course directed. Fourth, the invention also consists of attaching kite after kite at a convenient distance one behind the other.”

“The Patent also includes carriages drawn by these kites. The peculiarities of which are :—First, in the centre of front seat is a T handle, the perpendicular spindle, of which passing through the bed of the car, fits by a square at the lower end into a small horizontal wheel fixed to the centre pivot of front axletree ; by this apparatus, called the guide, the course of the charvolant is directed. Second, beneath the car, suspended by a spring, is a drag or regulator, acting by a lever power or a windlass, by which the velocity is controlled or the machine stopped. Third a platform with wheels is attached behind, for the carrying a poney.”

[*Printed, 5d. Drawing.*]

A.D. 1826, November 18.—No. 5423.

LACY, HENRY CHARLES.—Springs. This invention relates to “the suspending of carriage bodies on elastic beds or “bearings,” such as spiral or other springs, or india-rubber blocks, “which elastic beds or bearings need not be fastened “either to the body or the under-carriage of the vehicle, but “are confined and kept in proper position for acting with “effect by being enclosed in cylinders or cases, which cylinders or cases are firmly secured to the under carriage, each “of which cylinders or cases having one or more guide “pillar or pillars (also firmly secured), on which guide “pillar or pillars a vertically moving bar or plate works, “which bars or plates are connected by means of joints, links, “or shackles to the body of the carriage; and by means of “which pillars and bars or plates so connected and attached “the body of the carriage is suspended on the elastic beds “or bearings, and kept in its proper position.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1826, December 20.—No. 5438.

ANDREWS, FREDERICK.—Steam carriage. The various improvements comprised under the head of this invention relate to a method of passing the crank shaft through an aperture constructed for the purpose through the boiler, by which means the boiler may be hung nearer the ground; to a method of mounting the cylinder on springs; to the fire box of the boiler, and also to a method of steering. The carriage is supported on four wheels. In front of the carriage is a frame attached to the leading axletree and holding a single and smaller wheel. This wheel is controlled by a tiller from the carriage and the frame being weighed by luggage or otherwise, the movement to the right or left of the tiller or handle steers the carriage. The carriage is built over the machinery with accommodation for inside and outside passengers and a box in front for the steerer.

[*Printed, 8d. Drawings.*]

A.D. 1827, January 15.—No. 5448.

HALL, WILLIAM WILMOT.—(*A communication.*) Propelling carriages. This invention does not relate to any peculiar

construction of machinery for the above purpose, but it consists in constructing the boiler in such a way that, by means of a pump fitted thereto and worked by the engine, the heated gases, the products of combustion in the furnace, are drawn from the chimney or flue and forced into the boiler. Thence they pass with the steam to the engines. The piston of the pump has metallic packing and is single or double acting.

[*Printed, 5d. Drawing.*]

A.D. 1827, January 15.—No. 5450.

NEVILLE, JAMES.—Steam carriage. An oak framing supports the machinery necessary for driving the hinder wheels. These are of large diameter, formed by connecting the wooden felloes to the cast iron nave by means of a double set of wrought iron arms or spokes. The wheels are furnished with iron tires studded with steel buttons or projections, to secure adhesion. When steep hills are to be ascended, instead of the studs there are attached to the peripheries, plates of elastic steel about eighteen inches long, which are roughened on their outside surfaces. “These elastic steel plates are to be the width of the tire, and are affixed at one end by counter-sunk screws thereto, so that” when not compressed they “will form tangents to the circumference of the wheel.” They will be enabled “to assume the circular form of the tire as they ascend with the wheel from the ground; at the same time their extended surface will occasion greater resistance and prevent the wheels from slipping.”

The axle of the hinder wheels is cranked and is worked by a pair of oscillating cylinders. The wheels are however loose on the axle and are driven by toothed differential gearing controlled by a clutch apparatus. The machinery is managed both from the front, where the conductor is stationed, and from the rear where the fireman sits on a seat supported by springs. The carriage is supported on horizontal springs, a centre and inverted one resting on the end of two others, and is steered by a toothed pinion and segment moving a steering wheel in front. A fan is used to urge the fire.

[*Printed, 10d. Drawing.*]

A.D. 1827, January 15.—No. 5451.

MASON, WILLIAM.—“ Certain improvements in the construction of those axletrees and boxes which are usually termed  
“ or known by the name of mail axletrees and boxes.”

In this invention the nave of a carriage wheel is provided with a cast iron box, wedged therein, and with end plates through which and through the nave bolts pass as usual, the nave also being hooped as usual. On the arm of the axle, and enclosed by the inner portion of the nave, is a solid collar, the latter working inside the back plate of the nave, there being, however, a collar of leather between the two. On the other side of the collar on the axle is also another leather collar which bears against a projecting ring formed within the box of the nave the oil being thus prevented from escaping at that end of the box. The arm of the axle consists in the first place of a “wearing part” which is larger than the rest, there being beyond this a reduced part which leaves a space around it forming a receptacle for oil, and beyond this, again, is a part of still less diameter, this entering a cylindrical hole formed in the centre of a plug which is screwed into the front end of the nave box. The bottom or end of this hole is flat, but the end of the axle against which it bears is slightly convex, the friction between the two being thus reduced. A piece of leather may, however, be placed in the end of the hole if desired. In order to adjust the position of the nave upon the axle leather washers of different thicknesses are used, which may be placed between the flange of the screwed plug and the end of the nave, and the exact position of the plug may be adjusted by there being a number of holes in the end of the nave box, through any of which a screw may be passed which passes through the flange of the plug also. A similar effect may be produced by introducing washers of leather of different thicknesses into the hole in the plug. Oil for the lubrication of the parts is introduced through a hole in the plug, which communicates with other holes through one of which oil poured into the first hole finds its way into the reservoir in the front part of the nave box, the air escaping through the other hole. From the reservoir in front the oil passes along grooves in the box to a second reservoir in the

back of the latter, the whole of the parts being thus efficiently lubricated.

[*Printed, 6d. Drawing.*]

A.D. 1827, May 8.—No. 5497.

BENTLEY, DAVID.—“An improved carriage wheel.”

In this invention a metallic bush is first formed, through which is an opening for the reception of a “straight axletree,” there being in the outer surface of the bush recesses for the reception of the inner ends of the spokes of the wheel, and these recesses being so arranged that the inner end of one spoke is near one end of the bush, while the inner end of the next spoke is near the other end of such bush, plates being bolted to the end of the nave, into which the bush is inserted, the latter being provided with ribs or edge pieces which aid in securing it in its place in the nave, the latter being composed of wood, in the ordinary manner. The felloe of the wheel is of wood, and arranged in segments, the whole being surrounded by a tyre which consists of a hoop or rim, “welded” or otherwise fastened together with a concave surface,” the parts of the felloe being held in position within the tyre by means of wedge pieces and bolts.

The patentee mentions that he claims, as being of his invention the construction of a carriage wheel “the spokes” or radii of which constitute or represent the form of a “double cone, which by being united at the centre, as described, will be much stronger and admit of a change or repair of any of its parts without injuring the other parts of the wheel.”

[*Printed, 9d. Drawing.*]

A.D. 1827, May 26.—No. 5500.

BURGES, GEORGE.—Wheels and carriages.—This invention relates firstly to an improved axle box, called by the patentee an “hexacycle axle box.” The inside is formed of six equal convex segments of a circle whose diameter is determined by that of the spindle about which it is to revolve. The outside of the box is hexagonal and fits into the nave.

It also relates to an improved wheel, the spokes and felloes of which are made up of twelve pairs of similar “hexagonical

“ segments of a circle, so disposed as to form six radiating  
 “ ellipses for the spokes and six peripheral ellipses for the  
 “ felloes.” “ The two ends of each peripheral semi-ellipse  
 “ are united to each other by a tenon and mortice ” and “ the  
 “ two ends of the semi-elliptical spokes are fixed into the  
 “ nave, by means of a triangular shoulder, the six ends of  
 “ three contiguous ellipses are united at the periphery of the  
 “ wheel by two metal plates, countersunk inside and outside  
 “ of the wheel and rivetted to each other,” and “ wedges are  
 “ driven from the periphery each quite through the semi-  
 “ elliptical ” felloes and “ only partially through the semi-  
 “ elliptical spokes.”

The improvements in carriages consist in disposing the wheels in particular positions to be calculated according to the methods set out in the specification. A carriage having a trapezoidal base is mounted on four wheels the axles of which are disposed at the corners of a square placed diagonally to the framing. Thus the front and hind wheel are in line, the two side wheels being parallel. A three-wheeled carriage is also described the position of the wheels being similarly calculated.

“ The direction of the carriage is effected by various peris-  
 “ trephic movements applied to the fore and hind wheels.” Various methods are described, but “ any other mechanical  
 “ contrivance capable of giving the directions required ” may be used.

The improvements also comprise what the patentee terms “ hyperbolic shafts.” These shafts are curbed hyperbolically and the mode of attachment to the splinter bar and a pole, and the points of attachment of the draught harness are determined according to a method of calculation described in the specification.

[*Printed, 7d. Drawing.*]

A.D. 1827, June 28.—No. 5513.

FULLER, THOMAS.—“ Certain improvements on wheel car-  
 “ riages.”

This invention consists in adapting to four-wheeled carriages apparatus “ which is designed to prevent such carriages over-  
 “ turning, by preserving the body nearly in a horizontal

“ position at the time that one of the wheels accidentally  
“ passes over an obstruction or elevation in the road, and  
“ which obstruction without this contrivance would inevitably  
“ throw the carriage over.” A circular horizontal locking wheel is affixed to the front part of the carriage, which bears upon the bed of the front axletree, and upon segments supported by arms extending from the bed, being thus provided with bearings upon which it turns in the act of locking, the axletree bed itself being attached to and supported by the front springs of the vehicle. A horizontal bar crosses the middle of the locking wheel, and is attached to it by ears and bolts, there being a circular hole in the middle of this bar through which a pin passes, and this pin forming the pivot on which the locking wheel turns. The ends of the bar which extend beyond the wheel are cylindrical, and upon these are mounted plummer boxes or gudgeons, from which extend bent arms which support the front part of the body of the carriage, the result of the whole arrangement being that in the event of one of the fore wheels running over any elevated obstruction which may be in the road the axletree will as usual be thrown out of its horizontal position, but the body of the carriage in front will be retained in its horizontal position by the plummer boxes or gudgeons from which the bent arms proceed which support it turning upon the cylindrical ends of the horizontal bar.

[*Printed, 5d. Drawing.*]

A.D. 1827, August 15.—No. 5542.

SPONG, WILLIAM.—Antifriction axles. This invention consists in causing the revolving axle to bear against a single anti-friction roller instead of a fixed bearing. The wheels do not run on the main axletree but on shorter axles held at the ends of main axletree. These short axles run in a fork formed at right angles to the end of the axletree, the thrust being taken up by a stop or shoulder fitted to the axletree and properly lubricated. At the end of the axletree, outside the fork and above the axle is secured a friction roller, against which the axle rotates, the latter is held up against the roller by placing underneath it in the fork a block of wood or leather, which also holds the lubricating material. Hollow

places are constructed in the axletree to hold oil for lubricating.

[*Printed, 7d. Drawing.*]

A.D. 1827, October 11.—No. 5554.

GURNEY, GOLDSWORTHY.—Steam carriage. The external appearance of this carriage resembles that of the ordinary stage coach. It is mounted on four wheels as usual, and two small wheels, called pilot wheels, are added at the front end of the pole. These wheels are used to guide the carriage. The framework consists of three longitudinal perches placed parallel to each other, and extending the length of the coach. The two steam cylinders are placed horizontally between them. There are also two other longitudinal pieces disposed close to the hinder wheels. All five are united by transverse rails, so as to form a frame, the hinder end of which is sustained by the main axis of the hinder wheels and the fore end by the under carriage belonging to the fore wheels. The rear end of the pole extends beneath the centre perch, and is attached thereto by a bolt, around which the pole and the whole under carriage can be turned in order to give the fore wheels the required direction. “The axletree of the fore wheels bears  
“the pole by means of horizontal under springs which are  
“fastened crossways by their middles to the under side of the  
“pole, and their extremities are suspended from two other  
“short springs which are fastened crossways by their middles  
“upon the axletree of the front wheels.” The pilot wheels are turned in either direction by means of a lever worked from the coach box. The tendency of the wheel is always to run in a straight line forwards, because a spring is fitted to keep them in their position. Consequently, directly the steersman ceases to restrain the lever, the pilot wheels adjust themselves. The movement of the pilot wheels turns the fore wheels of the coach into the required direction.

The front boot of the coach is reserved for baggage, and the coachman's seat is fixed on this boot. Three other seats are provided for outside passengers in the usual way, and a seat is fixed behind the framing for the engineman. The boiler occupies the place of the rear boot, and is immediately over the rear axletree. The body is sustained in front by iron branches



fixed to the perches, and the hinder part rests on two strong springs fixed upon the longitudinal pieces before mentioned. The weight of the hinder part rests on the axletree of the rear wheels by means of brass bearings "which are applied beneath the longitudinal rails of the framing in order to receive cylindrical necks formed upon the axis close to where it enters into the naves of the wheels. The springs rest immediately above these bearings. The middle part of the axis is received in another bearing which is fastened beneath the middle perch. The two extremities of the axis of the hinder wheels are round, and they are fitted into boxes in the centres of the naves of the wheels in a similar manner to the axletrees of other coaches, and the axis may turn round independently of the wheels." A contrivance is provided by which the wheels or either of them may be made to turn with the axle. On ordinary roads one wheel may be free, the other being fast for driving purposes.

The escaping steam passes into a tank surrounded by a water casing. A fan is used to urge the fire. The description of the engines is not included in the series.

[*Printed, 1s. 9d. Drawing.*]

A.D. 1827, December 4.—No. 5574.

MEADEN, JOHN.—Wheel tires.—This invention consists in making the tires concave on their inner surfaces, to fit convex felloes. The iron for the tire is first rolled to the required section, made into a hoop, and brought to size by hammering on a cone of the proper dimensions. To shrink on the tire, the wheel is securely clamped to a metal dish supported horizontally on a pin passing through the nave, and resting on a friction collar. . . . The tire is put on hot, after which the metal dish and wheel are tilted on the centre pin, which is fitted to a horizontal axis for the purpose, so that the periphery of the wheel dips into a water tank. There is a friction roller in the tank to prevent the wheel dropping too far.

[*Printed, 10d. Drawings.*]

A.D. 1827, December 19.—No. 5591.

HOLLOND, THOMAS STANHOPE.—Propelling carriages, &c.—The propulsion is effected by means of a leading and a trailing

wheel connected by a system of levers arranged on the principle of a lazy tongs. These wheels are capable of moving with their frames along the longitudinal perch of the carriage, but by means of ratchets they can only rotate in one direction. If the lazy tongs be compressed, the leading wheel being unable to reverse its rotation, the trailing wheel must necessarily be brought up to it. Then as the lazy tongs is expanded the trailing wheel being unable to run backwards, the leading wheel is compelled to progress, and so propel the carriage. The compression and expansion are effected by hand levers.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1827, December 21.—No. 5592.

HARLAND, WILLIAM.—Steam carriage. This invention relates to improvements in the engines and boiler used in the propulsion of a steam carriage. It also relates to the arrangement of a condenser, which is disposed on the framing of the carriage under what would in ordinary carriages be the driving box.

The crank shaft is supported by four standards, “fitted with “sliding bushes to a motion corresponding with that of the “springs.” On this shaft are two driving pinions of unequal size which gear with similar pinions on the hind axle. These driving pinions are thrown in and out of gear according as the speed is required to be increased or diminished. Perpendicular guides are provided for the purpose of keeping the crank shaft and axletree parallel to each other during the action of the springs.

In order to steer the carriage, a vertical spindle extends upwards from the centre of the fore axle. At the top it is fitted with a horizontal wheel worked by an endless screw or “toothed female screw,” by turning which in either direction the direction of the wheels is altered.

[*Printed, 10d. Drawing.*]

A.D. 1828, March 20.—No. 5628.

GOUGH, NATHAN.—Steam carriages.—The boiler is mounted at the back of the carriage, and the engines are placed in a box partly underneath and in rear of the carriage. They drive the hind wheels by means of pitch chains working on the ends

of the engine shaft and pinions on the naves of the wheels. The conductor sits in front, and from his place, by means of hand and foot levers, controls the machinery and steers the carriage.

The steering is done in the following manner. Each of the two front wheels is separate from the others, there being no transverse axletree. Each wheel is attached to a vertical pillar, which moves freely at the upper parts, and rests on the end of a transverse spring at the bottom. At the extremities of the short axletree arms there are connecting rods which are put in motion by a hand lever working a vertical shaft. At the time of working the hand levers the valves of the engines are so controlled by means of a shaft and gearing communicating with the steering gear, that the wheel on the opposite side to that to which the carriage is turning is caused to travel faster than the other. The engine is also fitted with differential motion gearing worked also from the front of the carriage. An index pointer is added to assist the steersman.

[*Printed, 1s. 11d. Drawings.*]

A.D. 1828, April 15.—No. 5638.

WRIGHT, LEMUEL WELLMAN.—“Improvement or improvements in the construction of wheel carriages, and in the machinery employed for propelling, drawing, or moving wheel carriages.”

In this invention a strong framework is in the first place formed of a number of longitudinal beams connected by uprights and cross bars, and on the top of this framework is placed a close carriage body for inside passengers, and also a body which is surmounted by a roof raised upon pillars, and furnished at the sides and ends with curtains which may be closed or opened at pleasure. There are also seats for a conductor and other persons. Below the carriage bodies are two metal cylinders for the reception of compressed air with which they are filled in the first instance from stationary reservoirs, the air being allowed to pass from them to a third cylinder in which it is rarefied and rendered more expansive by the heat from a furnace arranged for the purpose, pipes from the furnace leading hot air through the air in this third cylinder. Such air is then admitted to the cylinders of an engine suit-

ably arranged in the lower part of the framing, the piston rods of the engine being provided with connecting rods, and these acting upon cranks in a shaft mounted in suitable bearings, and carrying pulleys from which straps proceed to pulleys fixed upon the naves of the hind wheels of the vehicle, such wheels being thus caused to rotate and propel the vehicle. If preferred, the heat from the furnace, or steam generated thereby, may be mixed with the compressed air in the cylinders of the engines, and the third cylinder mentioned above be dispensed with, and a crank or eccentric on the shaft worked by the connecting rods of the engines may be made to work a force pump, and so compress air into the cylinders first mentioned when the vehicle is going down hill, such pump also acting as a brake. The carriage is guided by means of a handle and certain shafts and gearing, by which motion is given to a pulley from which chains pass to a second pulley having connected to it other chains also connected with the front axle. At different stations in the road reservoirs of compressed air are maintained, from which the cylinders of the vehicle may be filled, and the invention includes a rotatory engine which is meant for propelling a carriage, this consisting essentially of a large cylinder having within it a smaller cylinder, the latter being provided with "piston leaves" which are hinged to it, against which steam or heated or compressed air may act, such piston leaves being opened and closed alternately by means of a stop piece and certain trip levers.

The vehicle first mentioned is adapted to carry passengers and goods, and also to draw other carriages after it.

[*Printed, 8d. Drawing.*]

A.D. 1828, August 11.—No. 5680.

HIGGINS, JOHN LANE.—"Certain improvements in wheel carriages."

This invention relates to a carriage which is provided with two fore wheels, but with one hind wheel only. The perch is double, being composed of two parallel longitudinal bars, united by cross bars, and also passing through a transome, the hind wheel working between the two parts of the perch at the back. A "fore carriage" upon which the body of the carriage rests, is described as consisting of a square frame, of

which the sides are curved downwards, this frame being supported by springs which rest upon the axle of the front wheels. To the "bed" of the fore carriage, which is directly above the front axle, is connected an iron staple which forms a "double centre," the front of the perch passing through this staple, and certain curved pieces of timber which are connected to the transome working outside the ends of this staple, which extends over the greater part of the length of the transome. Futchells are connected to the fore carriage, and in one of the cross bars of the perch is a bolt or stud against which a curved bar or rod which is connected to the sway bar bears when the carriage is "on the lock," or being turned, the curved pieces mentioned above then turning around the ends of the staple. The result of the whole arrangement is that a body being placed on the fore carriage will turn with it "in the same manner as a two-wheel carriage," the front wheels being of the same diameter as the hind wheel, and the body turning between them. Another body, boot, or seat may, however, be placed over the hind wheel, "with a recess for that wheel to work in." The patentee mentions several advantages as arising from this invention.

[*Printed, 6d. Drawing.*]

A.D. 1828, September 4.—No. 5694.

SEAWARD, JOHN, and SEAWARD, SAMUEL.—"A new and improved method or methods for propelling or moving carriages and all other vehicles on roads; and also ships, boats, and other vessels on water."

[*No Specification enrolled.*]

A.D. 1828, September 11.—No. 5700.

MINIKEN, THOMAS.—Seats, &c. for carriages and other purposes.—This invention consists in fitting a seat, such as an arm chair, with a moveable back and foot rest. These are so connected by a system of adjustable levers and palls, that as the back is raised towards a vertical position, the foot rest is simultaneously lowered, and *vice versa*. This movement may be performed from the chain itself by using the arms as fulcra. The invention is claimed to be useful in its application to carriages.

[*Printed, 6d. Drawing.*]

A.D. 1828, December 10.—No. 5727.

RILEY, ZACHARIAH.—Safety apparatus for carriages. This apparatus is for suddenly disengaging horses and for braking the wheels.

The pins upon which the traces are hooked form part of an iron frame, connected with two levers, by means of which the frame and pins may be raised or lowered, the pins passing through the splinter bar. On raising the frame the ends of the pins enter into sockets in an upper iron bar for the purpose of holding the traces and when the frame is lowered, which may be done by releasing a lever held by a spring catch, the pins descend with it and release the traces. The act of releasing this lever also puts in motion another lever lying along the pole of the carriage. This lever acts to release the throat straps of the horses from the pole end, and also, when four horses are used, to release the swingletree.

In order to prevent locking of the fore wheels when the horses are released the same operation causes a pin to pass through the futchels and to enter notches in the wheel plate, thereby fixing the fore carriage.

The apparatus for securing the hind wheel, consists of a friction band round the nave and also a tumbler catch to be thrown by a lever into a groove in the nave of the wheel. This apparatus is worked by pulling a cord from the box or other part of the carriage. As the wheel always locks at the same point, a thick piece of steel is put upon the tire at the point where it then rubs against the ground, in order to save wear.

[*Printed, 8d. Drawing.*]

A.D. 1828, December 15.—No. 5740.

SLATER, JOHN.—“Certain improvements on axletres, and the boxes for carriage wheels.

The patentee thus sets forth his invention:—“I make a large sized hole or hollow into the end inside of the axletree arm, and at or near to the bottom or lower part of the said hole I make a small hole or holes into the side or wearing part of the axletree arm, which hole or holes are made to join and communicate with the large end hole

“ inside the said arm, and the small holes are made opposite  
 “ and pointing to the recess for the oil chambers in the  
 “ boxes of the axletree for introducing oil to the inside; and  
 “ each box I first make in two or more separate parts, the  
 “ outside of wrought iron and the inside of brass or any other  
 “ metal or metals, with a recess or recesses, or oil chamber  
 “ or chambers inside or between the two metals. The out-  
 “ ward part or covering of the axletree boxes I make of  
 “ wrought iron, which iron is fitted on the outside of the  
 “ brass or other metal box, and is shrunk upon it while hot, and  
 “ both the outward and inward parts of the boxes are more  
 “ secured together with screws or rivets for making the boxes  
 “ firm, which axletrees and boxes I make with or without  
 “ hole or holes in either of them, or the oil chambers or  
 “ recesses. And for the convenience of supplying the axle-  
 “ trees and boxes with oil there are recesses or grooves  
 “ inside the boxes and for my convenience I make the axle-  
 “ trees and boxes without any hole or holes, or oil reservoir  
 “ to either of them, and I make the inward parts of the boxes  
 “ of brass or any other metal or metals, and the outside of  
 “ the boxes I make of wrought iron, and secure the boxes to  
 “ the axletrees in the usual manner, either with short screws  
 “ or long screws, bolts, or screws only, as most convenient,  
 “ the axletrees and boxes being so contrived that any of the  
 “ most approved principles may be applied for holding and  
 “ securing the boxes and wheels firm to the axletrees.”

[*Printed, 8d. Drawing.*]

A.D. 1828, December 18.—No. 5745.

JOSEPHS, EDWARD. — “ Certain improvements in wheels,  
 “ axletrees, and other parts of carts, waggons, and other  
 “ conveyances.”

This invention consists in certain arrangements for the  
 purpose of enabling carts, waggons, and other vehicles of  
 similar character, including trucks and drays, to be furnished  
 with wheels of larger size than usual, “ for the sake of obtain-  
 “ ing greater ease in the draught, and also for overcoming  
 “ any obstacles, as stones, holes, and ruts the more readily,  
 “ which it is the well-known property of high wheels to  
 “ effect.” An arrangement suitable for a waggon is described  
 in which the wheels are by preference six feet in diameter,

“ or higher,” the axletrees being cranked or bent downwards inside the arms, so that the parts of the axles upon which the body of the waggon rests are no higher than the axles of a waggon having wheels of the ordinary size. These portions of the axles are partially enclosed in woodwork, and secured to the summers or beams of the waggon by means of iron straps, the body of the waggon being, moreover, secured to the axles “sideways” by other straps or staples, and iron stays passing diagonally from the body of the carriage to the axles and aiding in maintaining them in their proper positions. One arrangement is set forth in which a waggon is provided with large hind wheels, while the fore wheels are of the usual size, and the patentee mentions that for the sake of obtaining “ greater strength, combined with lightness” he places all the beams or summers of the vehicle “ edgeways of the timber “ instead of breadthways,” contrary to the usual custom.

[*Printed, 8d. Drawing.*]

A.D. 1829, January 31.—No. 5764.

PARKER, ROBERT.—“ An improved drag or apparatus which “ is applicable to stage coaches and other wheel carriages, “ and whereby the motion thereof may be retarded or stopped “ when required.”

“ The structure of this improved drag may be explained by “ comparing it to a human leg,” the main parts consisting of a foot and shoe, an ankle joint, and a knee joint. The upper end of the leg is attached to the under side of the axle of the hind wheels of the vehicle by its knee joint, about which the leg is moveable, and may be drawn up by a person on the carriage pulling at a small line or chain and placing it upon a hook at the back part of the carriage. The drag is thus kept suspended, in an inclined position, the shoe being raised off the ground. The usual drag chain is connected at one end to the perch or frame of the vehicle and at the other end to the foot of the drag; the drag chain hanging slack when the drag is raised, and being clear of the ground. When it is requisite to apply the drag the small line or chain is detached from the hook (which may be effected by persons either inside or outside of the vehicle, and the drag then falls, bringing the shoe to the ground, the leg of the drag, by the



advancing motion of the carriage, being then brought into a nearly upright position under the end of the axle, and so raising that end of the axle and the wheel thereon as to lift the wheel from the ground, the ordinary drag chain preventing the drag from passing too far backwards. The drag now sustains all that part of the weight of the carriage which was previously borne by the raised wheel, and by its friction on the ground retards the progress of the carriage. The drag may instantly be released by again pulling at the small line or chain already mentioned, such line or chain being attached to the leg of the drag by a moveable ring, which with the aid of a bent lever and certain other details is adapted to confine the foot and shoe rigidly to the leg of the drag, when in action. The first effect of pulling at the line is to raise the ring and release the bent lever from it, the foot then becoming loose, and moveable about what is termed the ancle joint, the result being that the end of the axle descends and brings the wheel again to the ground, the further action of the line or chain raising the parts into their first position, another line or chain being so arranged that by pulling at it the end of the bent lever will be lodged within the moveable ring, again securing the foot rigidly to the leg; a certain loop aiding to produce this effect.

The details of this invention are minutely described, and may to some extent be varied.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1829, May 30.—No. 5796.

WINANS, Ross.—Diminishing friction in carriages. According to this invention four secondary or friction wheels are employed “or two, if applied to two-wheeled carriages, made “of cast iron or other proper materials, and of about one-third “to one half the size of the running wheels, and having a rim “projecting on one side of each of them, the inside periphery “of which is turned smooth and cylindrical; the necks, pivots, “or gudgeons of these secondary or friction wheels being “but short, they may of course be proportionally small in “diameter, and they must be made to turn in brass or other “proper bearings affixed to the frame of the carriage, in “order to reduce or diminish their friction as much as

“ possible. The four main cast iron wheels which run upon the surfaces of the two rails of the railway may either be fast or loose upon their axles, or one of them be fast and the other loose, as occasion may require.” “ These axles are made to extend on each side beyond the naves of the main wheels, and are formed into cylindrical necks or pivots, which act underneath the inside peripheries of the friction wheels on each side, and thus hold up or support above the rails the friction wheels and the frame and body of the carriage, together with its load, and when the carriage is moved forward the necks or pivots of the axles roll or turn within the peripheries of the friction wheels, causing them also to revolve slowly, whilst the necks or pivots upon the ends of the axles of the friction wheels revolve still more slowly in their brasses or bearings, and thus the friction is reduced.”

The invention includes a mode of enabling carriages to travel round curves by giving the axles a certain degree of play in the bearings in which they work; and also a mode of lubricating the axles and friction wheels. The power of turning curves is given by allowing the axle arm a certain liberty of play in the inside of the periphery of the friction wheel.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1829, July 4.—No. 5808.

CRABTREE, ROBERT.—Propelling carriages. A beam pivoted at its centre carries two rolling discs or weights, one at each end of the beam. They are connected by a system of bars after the fashion of a lazy tongs. To the support of the beam is also fitted a pendulum the upper end of which is connected with the lazy tongs. The effect of the oscillation of the pendulum is that the tongs are compressed on one side or the other of the centre of motion of the beam and consequently the position of the sliding weight on that side is also altered. The consequence is that the beam rocks, and this movement is made use of to work cranks in the wheel axles, or to propel the carriage by means of props or crutches.

[*Printed, 9d. Drawings.*]

A.D. 1829, July 4.—No. 5809.

KNOWLES, MARGARET.—“An improvement in axletrees for  
“and mode of applying the same to carriages.”

In this invention each fore wheel of a carriage has a separate axletree, and works loosely upon the arm thereof, as usual, the axletree being provided at some little distance inside the arm with a vertical standard or fulcrum mounted at the upper and lower parts in suitable bearings, the upper ends of the fulcrum being mounted and steeled, “so as to bear the weight  
“of the carriage and yet revolve without comparative friction,” the axles turning upon these fulcra when it is necessary to turn the carriage. Diagonal braces are so placed as firmly to secure the axletrees to the standards or fulcra, and to the axletrees are also connected arms, which are united by a cross bar to which the pole of the carriage is jointed, the arms being also jointed to the axletrees in such manner that “they may play up and down in case the carriage  
“is upon springs.” The result of the whole arrangement is that when it is requisite to turn the carriage the movement of the pole in an angular direction causes both the axles of the front wheels to assume simultaneously angular positions corresponding therewith.

[*Printed, 6d. Drawing.*]

A.D. 1829, July 4.—No. 5811.

SCULTHORPE, GEORGE KING.—“Certain improvements on  
“axles or axletrees, and coach and other springs.”

This invention consists, firstly, “in causing the arm of the  
“axle to be separate from the bed,” and “to revolve in  
“the bed while it is fixed in the nave,” this part of the invention including also “a mode of impeding or retard-  
“ing the revolutions or action of the said arm by means  
“of a wedge.” The axletree bed consists of an iron bar passing across the carriage framing, and having, projecting from it downwards, bearings in which work short axles, of which there is one to each wheel, the wheel being fixed upon the axle arm, outside the bearings, and wheel and axle revolving together. Below each axle is mounted a lever, in connection with which is a wedge, and by pulling at a chain connected to the end of this lever, which chain may extend

to any convenient part of the carriage, the wedge may be forced between the inner side of the bed and the axletree, thus retarding the movement of the latter end of the wheel, a spring removing the wedge from the axle when the chain is released. The axletree and bearings are surrounded by a box or case, which serves to preserve them from dirt and also as a reservoir for oil. The iron bed of the axles is bolted to a wooden bed, placed immediately over it, and adjusting screws are applied to regulate the end play of the axles.

Another part of the invention relates to an improved spring for carriages and other purposes, and consists in the employment of a hollow inverted cone, which may be made of cast iron, and which is to be supported by suitable framing. To this inverted cone a cap is fitted which is provided with a central collar, and through this collar a vertical rod is passed on the upper end of which "whatever weight is to be supported must be placed," there being at the lower end of this rod a strong forked steel spring, which, as the rod is pressed down, is compressed by its ends bearing against the inner sides of the cone, such sides, however, causing a tendency to reaction in the spring and thus giving elasticity to the action of the rod, the inside of the cone being duly supplied with oil.

[*Printed, 5d. Drawing.*]

A.D. 1829, July 25.—No. 5819.

QUETIN, LOUIS.—Improved form of carriage. The patentee thus describes his improvements:—"My improved vehicle or combination of vehicles is entirely supported upon one single broad wheel of large diameter, such single wheel being situated in the centre of the spaces between several coach bodies, magazines, or boots, which are to contain passengers, and luggage or goods, and which bodies, magazines, or boots are combined together by peculiar mechanism so as all to hang on a framework which is supported by two pivots, one at each end of the axle of the large single wheel, the said pivots projecting out from each end of the nave or centre of that wheel in order to support the said framework; the suspension and combination of the different bodies to the said framework being effected in such manner as that they shall exactly balance each other

“ at the opposite ends of the axle of the wheel, as well as at  
“ the opposite points of the circumference of the wheel before  
“ and behind the same, and also in such manner as that the  
“ centre of gravity of the whole of the vehicle or combina-  
“ tion of vehicles shall be considerably lower than the centre  
“ or axle of the central wheel, whereby a security against  
“ overturning or upsetting is obtained; for the single wheel  
“ which supports my new or improved vehicle or combination  
“ of vehicles, being equally urged in opposite directions by  
“ the balanced weights of all the several combined bodies,  
“ will, of itself, have no tendency to depart from the vertical  
“ position unless the centre of gravity of the whole mass is  
“ moved forcibly sideways by accidentally coming in contact  
“ with some obstacle; and, to prevent any chance of over-  
“ turning in such case, four rollers or small wheels are pro-  
“ vided, one at each of the angles of the framework within  
“ which the single central wheel is included, and upon which  
“ framework all the bodies depend, so that there are two of  
“ the said rollers on each side of the central wheel, or two  
“ before and two behind the axle of that wheel. None of  
“ these four rollers touch the ground when the great wheel is  
“ vertical or nearly so; but whenever the wheel is caused by  
“ any obstacle to incline over considerably to one side, the  
“ rollers on that side will come to touch upon the ground,  
“ and prevent so much inclination as would endanger the  
“ oversetting of the vehicle; and the said rollers are attached  
“ to the framework by the intervention of springs, which  
“ yield when either of the rollers touch the ground, so as to  
“ avoid any shock or concussion, and by the reaction of those  
“ springs the great central wheel will be restored to the  
“ natural vertical position as soon as the impulse which  
“ caused it so to incline over on one side has ceased, and  
“ when the equilibrium of the different bodies which are  
“ suspended, as aforesaid, on the opposite sides of the wheel  
“ regains its influence to preserve that wheel in its vertical  
“ position. In some cases the said new or improved vehicle  
“ may be made with only one body or vehicle suspended  
“ concentrically with the wheel, and occupying the interior  
“ of the wheel, which, in that case, can have no spokes or  
“ naves, but must be only a circular ring to which four or  
“ more strong rails are firmly fixed so as to project out each

“ way at right angles to the plane of the ring or wheel ; and  
 “ at each of the ends of those four or more rails crosses are  
 “ fixed to unite all the rails together, in order to form a sort  
 “ of cage or lantern framework which rolls over and over  
 “ when the ring of the wheel rolls along the road ; the weight  
 “ of the whole cage being supported upon the ring of the  
 “ wheel, which forms a zone at the middle of the length of  
 “ the cage. Within the interior of the cage the body or  
 “ vehicle is suspended upon centre pins, which are fitted into  
 “ the centres of the two crosses which form the ends of  
 “ the cage, the said centre pins being concentric with the  
 “ rim of the wheel ; and by this means of suspension the  
 “ body or vehicle being made heavier on one side will always  
 “ hang the same way upwards within the cage or framework  
 “ when the same is rolling round to advance along the road.  
 “ Or otherwise, the new or improved vehicle or combination  
 “ of vehicles may consist of two distinct bodies or vehicles,  
 “ suspended and equally poised at the two ends of the axis of  
 “ a central wheel, which is made with spokes and a central  
 “ nave, and a long axis projecting out each way from that  
 “ nave in order that the said bodies or vehicles may be  
 “ suspended therefrom, one at each end, or at opposite sides  
 “ of the central wheel, in such manner as that each body or  
 “ vehicle may hang freely down from the said axis, or the  
 “ same way upwards.”

[*Printed, 2s. 4d. Drawings.*]

A.D. 1829, August 5.—No. 5827.

BROWN, THOMAS. — “ An improved coach, particularly  
 “ adapted for public conveyance and luggage.”

This invention consists in “ a new combination and arrange-  
 “ ment of various parts which have been heretofore used in  
 “ carriages of different descriptions,” but which parts are  
 here combined and arranged in such manner that a vehicle  
 is produced which possesses the advantages of lightness,  
 safety, steadiness of motion, and great capacity for carrying  
 luggage, which luggage is “ on springs, and locked up under  
 “ cover.” The vehicle is without perch or frame, the body  
 thereof being brought nearer to the ground than usual. The  
 fore carriage is made with “ under springs,” and “ applied

“ immediately beneath the bottom of the fore boot, whereby  
“ the pole, being upon springs, gives some ease to the wheel  
“ horses.” The hind axle is cranked downwards “ so as to  
“ allow the usual hind boot to be enlarged at bottom into a  
“ capacious luggage box,” which extends forward under the  
body of the coach, the weight of the luggage being nearer to  
the ground than in ordinary arrangements, and great facility  
being afforded for loading and unloading, the danger of over-  
turning being thus also reduced. The springs of this vehicle  
are disposed lengthwise, and not combined with cross springs,  
“ whereby much weight and wear is saved,” and in conse-  
quence of these arrangements “ the chief parts of the works ”  
may be made “ rather lighter than usual,” and yet with less  
risk of the vehicle breaking down, “ because the parts thereof  
“ are less exposed to the strain of the swinging motion of the  
“ body ” on the spring. The body of the vehicle is fortified  
underneath by making the bottom pieces, or “ rockers ” to  
extend the whole length of the vehicle, such rockers being  
curved upwards at the front ends “ to clear the wheel transom  
“ in locking,” and being deep enough at the hinder ends “ to  
“ give the extra depth at bottom to the inside of the body  
“ for the feet of the passengers.” These rockers are  
strengthened by means of iron plates, cross framing, and  
boarding. The door at the back of the hind boot does not  
open down to the bottom of the luggage piece, and the cross  
piece beneath that door strengthens the bottom and also pre-  
vents parcels from falling out. The hinder springs are fixed  
across the hinder axletree, and from the ends of these springs  
the hinder part of the body is hung by iron fastenings which are  
fixed to the sides of the rockers, the eyes at the hinder ends  
“ of the springs being oval, “ in order to allow the springs to  
“ play,” and to the under sides of the rockers are connected  
the inner ends of two other springs, these being provided at  
their lower sides with strong leather braces also connected to  
the rockers, and both springs and braces passing backwards  
to the cranked part of the hinder axle, the leather braces  
being united to that part of the axle by shackles, these springs  
and braces not only retaining the cranked axle in its place in  
the event of the upper springs giving way, but also at all  
times serving to assist such springs.

[*Printed, 5d. Drawing.*]

A.D. 1829, September 30.—No. 5853.

MOORE, JOHN.—Propelling and steering carriages, &c. The propulsion is effected by causing the power to act on bars that turn partly on the axis of the propelling wheels, such bars having clips at their ends worked by spring apparatus, in such a way that each bar seizes the periphery of the wheel in its clip, carries it partly round, releases it and then repeats the stroke.

The fore carriage which is mounted on two wheels is pivoted at the front end of a perch, at the other end of which the remaining portion of the carriage is similarly pivotted. In front of the fore carriage is a horizontal pulley worked by a hand lever or wheel. A rope passes round this pulley, along each side of the fore carriage to a pulley on the perch between the two portions of the carriage. Then the rope crosses itself and the ends are then fastened to the front corners of the rear portion of the carriage. By turning the steering pulley therefore, the hind wheels are directed at the same time that the fore wheels are steered either way.

The improvements also relate to steam condensing apparatus.

[*Printed, 10d. Drawing.*]

A.D. 1830, January 26.—No. 5887.

JOHNSON, GEORGE FREDERICK.—“A machine or apparatus which is intended as a substitute for drags for carriage wheels and other purposes.”

This invention relates to the application of brakes to the naves of the wheels of carriages. On the nave of each wheel to which a brake is meant to be applied is fixed a ring, the periphery of which may be of angular or any other suitable form, a brake, of corresponding figure internally, being mounted upon a pivot or fulcrum which is supported by a projection from the bed of the carriage or the back of the axle. An arrangement is described in which each of the hind wheels of a four-wheeled vehicle has a ring and brake applied to it, the two brakes being pressed upon the rings simultaneously when requisite by means of a lever mounted upon a suitable fulcrum, and being connected at its lower end to a second lever or bar, which passes across the framing of the



vehicle between the wheels and is connected at the ends to the brakes through the medium of links, the arrangement being such that by moving the first lever in one direction the brakes are pressed upon the rings, while on moving it in the other direction they are released therefrom, the upper end of that lever forming a handle which may be conveniently operated upon from the back seat of the vehicle.

[*Printed, 6d. Drawing.*]

A.D. 1830, February 27. No. 5906.

GRISENTHWAITE, WILLIAM.—“An improved method of facilitating the draft, or propulsion, or both, of wheeled carriages.”

[*No Specification enrolled.*]

A.D. 1830, February 27.—No. 5908.

POOLE, MOSES.—(*A communication.*)—“A certain combination of or improvement in springs applicable to carriages and other purposes.”

This invention consists “in so applying the weight of a carriage or other body to be supported by a spring plate as to cause the said plate to twist in a spiral direction, and the tendency of which to untwist causes the necessary reaction and elasticity required when the said body is put in motion.”

An arrangement is described as being applicable to a stanhope or dennet, in which the shafts consist of prolongations of the sides of a frame which extends backwards below the body of the vehicle, the splinter bar being connected with the front of this frame. Within this frame, and parallel with the sides thereof are mounted two broad spring plates of steel, which are held firmly, midway of their length, by clamps fixed upon the axletree, with which the plates each form an angle of about forty-five degrees, being inclined towards each other, and being furnished at the ends with pivots which rest in suitable bearings attached to the sides of the frame. With the under side of the body of the carriage are connected other clamps and bearings which sustain other spring plates, similar to those first mentioned, but forming right angles therewith, and from these plates arms or levers project

which are connected by means of shackles with similar arms or levers projecting from the other plates, the result of the arrangement being that on the weight of the carriage body coming upon the arms or levers the latter will twist the spring plates to which they are fastened in a spiral direction, "the spiral turning different ways from the centre" of each plate.

From one part of the Specification it would seem that the plates are slightly twisted into the spiral form before being applied to the carriage.

[*Printed, 5d. Drawing.*]

A.D. 1830, February 27.—No. 5913.

HOWARD, WILLIAM.—"Certain improvements in the construction of wheels for carriages."

This invention consists essentially in the employment of certain "spoke shoes," into which the outer ends of the spokes of a carriage wheel are inserted, these spoke shoes being each rivetted to the inner part of a wrought iron ring called the "shoe ring," the latter being surrounded by an iron tyre, which may either consist of one complete ring, or be put on in separate "streaks" or strips. The spoke shoes are in the first place connected to the shoe ring, being of suitable curvature at their outer ends to adapt them for fitting closely to the inside of the ring, and each shoe is secured to the ring by two rivets. Each shoe is formed with a recess for the reception of the end of a spoke, and when the spokes have been secured in the nave of the wheel their outer ends are forced sideways into the recesses of the shoes, each recess being then closed by a plate which is rivetted to the shoe and keeps the spoke within it. The ends of the spokes do not reach to ends of the recesses in the shoes, wedges of wood being driven into the shoes beyond the spoke ends, and iron wedges, again, being driven into the wedges of wood, the end of each spoke being protected from injury by the wedges by a small plate of metal. These operations being completed, the tyre is then placed outside the spoke ring, and completes the wheel, no wooden felloe or rim being used. If preferred, the spoke shoes and spoke ring may all be cast together in one piece, instead of being united by rivetting.

[*Printed, 7d. Drawing.*]

A.D. 1830, July 1.—No. 5950.

CLIVE, JOHN HENRY.—Propelling and supporting carriages. This invention relates firstly to the application of wheels of larger than usual diameters, which wheels are driven by machinery through cranks, pinions or pulleys, all of larger diameter than usual for the purpose of obtaining greater leverage. For common roads these wheels should be from eight to twelve feet in diameter.

It also relates to a method of propelling vehicles by means of a large driving wheel placed in the centre of the carriage. The two ordinary leading wheels are on an axletree which swivels on an upright perch for the purpose of steering the carriage. The two hind wheels are attached to the carriage by under-springs, and only a small portion of the weight of the vehicle is thrown upon them. The chief weight is borne by the large central wheel. “The action by which the locomotive machinery is advanced along the road being thus applied in the middle of the breadth thereof, the machinery will be found to turn more readily aside, and to be more completely under the command of the person who guides or steers the same than it would be if made according to the usual plan.”

[*Printed, 4d. No Drawings.*]

A.D. 1830, July 19.—No. 5956.

RAWE, JOHN, junior, and BOASE, JOHN.—Steering and propelling carriages. The motion of the driving axle is communicated to the driving wheels by means of curved radial arms which are keyed firmly to the axle and at their other extremities are bolted to an iron ring, screwed to the wheel spokes. “The whole of the frame and engine is supported on springs; and to allow springs to be applied to the cranked axle, two strong rods are used; each of these is firmly jointed at one end to the frame, and attached at the other end to the cranked axle by bearings, by which means the frame is allowed to rise or fall freely, while derangement thereupon is prevented.”

In order to steer the carriage a fifth and smaller wheel is supported in a circular frame in rear of the two leading wheels. This circular frame runs by friction rollers against

another and similar frame superposed. The latter is attached rigidly by bars to the leading axle. The wheel may be swivelled to right or left by means of a hand wheel and connecting rods attached to the circular frame, and by this means the leading wheels are also turned.

[*Printed, 1s. Drawings.*]

A.D. 1830, August 5.—No. 5965.

RUTHVEN, JOHN.—Propelling carriages. This invention, which is also applicable to the propulsion of boats, consists in fitting a toothed pinion on the driving axle and communicating motion to the pinion in the following way. Two other pinions are arranged in a frame in a line with each other and the first pinion. They all then gear together. Upright arms are fitted loosely on the axes of the two latter pinions and are connected with a horizontal bar with handles at the ends. On the upright arms are palls which take into the two pinions, but reverse ways, so that by pulling alternately from the ends of the horizontal bar the toothed pinions are alternately acted upon and move always in the same direction, at the same time communicating motion to the pinion on the driving axle.

[*Printed, 8d. Drawing.*]

A.D. 1830, August 5.—No. 5971.

MALLET, WILLIAM.—Wheelbarrows. The inventor makes the bodies of these barrows of iron by stamping or pressing a plate between dies. The metal overlaps at the angles, and if the sides of the barrow are more upright than usual he cuts a piece off at the corners, but still leaves sufficient to overlap. He likewise turns the edge or rim a little outwards. He avoids the formation of angles where the sides join the front ends and bottom of the barrow. This is done to increase strength and prevent lodgement of water. For the latter purpose a few holes are also pierced with the burr downwards. Angle iron may also be rivetted round the edges to strengthen them.

The framing and legs of the barrow are made of angle iron rivetted or screwed together. The ends of the side pieces are socketted to receive wooden handles. Various methods of

attaching the body to the framing are shown. The wheel is of iron. The ends of the spokes fit into mortices in the rim. The spokes are bent until the ends will enter the mortices and are then straightened. The axle of the wheel is screwed so that the latter may be held on it between and by means of two collars, through which also a pin may be passed. The ends of the axle run in case-hardened iron block.

[*Printed, 10d. Drawing.*]

A.D. 1830, August 5.—No. 5972.

PEARSE, JOHN.—“An improved method of making and constructing wheels, and in the application thereof to carriages.”

In this invention the rim of the wheel is composed of an inner and an outer iron ring, the inner ring having holes in it for the reception of the outer ends of cylindrical iron rods which form the spokes of the wheel, such holes being so arranged that each alternate rod points towards and is secured to one end of the nave, while the other rods point towards and are secured in the other end of such nave. The holes in the inner ring through which the spokes are passed are widened outwardly, and the outer ends of the spokes are thickened so as to fit into and fill such holes, being then secured from moving outwards by the outer ring being placed around them. The nave of the wheel is composed of wood, hoops of iron being placed around the ends, and projecting beyond them, the inner ends of the spokes passing through holes in these hoops and being secured therein by nuts screwed upon them. The outer end of the nave is covered in by a metal cap, and the inner end is nearly closed by an iron plate, having, however, a hole through its centre for the passage of the axle arm, the cap and plate being secured to the nave by screws which pass entirely through the nave, and bind all three together. In the centre of the nave is embedded a box of iron, brass, or gun metal, wings projecting from the box entering grooves in the nave, in the ends of which grooves wedges are afterwards inserted. The metal in the centre of the box is removed, a receptacle for oil being thus formed, such oil being introduced through a hole in the nave, which is furnished with a screw plug. Cavities for oil are likewise provided at the inner end of the nave and within the outer cap.

An iron axletree is described, which is provided with wings, in which are holes for the passage of screws by means of which the axletree is secured to the carriage, the ends of the axletree being hollow, and receiving within them the inner parts of two cylindrical iron or steel arms, on which the wheels turn, each arm having a groove in the inner part for the reception of the end of a pin by which it is prevented from turning round. On the outer end of each arm is a head which prevents the wheel from leaving the arm by moving outwards, the plate on the inner end of the nave having the hole therein made slightly conical, and working against the end of the axletree, which is of corresponding figure. The exact position of each axle arm in the axletree is determined by means of a screw which passes through the axletree and enters a hole in the arm. The head of this screw is square, and when the screw has been inserted into its place a bent bar, having a square hole therein which fits upon the head of the screw, is fixed to the axletree by other screws, the first screw being thus prevented from becoming unscrewed by the shaking of the carriage or otherwise. The iron spokes may be ornamented by being covered with brass or other metal.

[*Printed, 6d. Drawing.*]

A.D. 1830, August 24.—No. 5986.

MASON, WILLIAM.—“Certain improvements on axletrees, “ and also the boxes applicable thereto.”

According to this invention the arm of the axletree is cylindrical, and has a solid collar formed upon its inner end. A cavity is formed within it, by boring from the outer end, for the reception of oil, a hole leading from this cavity to a shallow groove which extends along the upper part of the arm. That part of the arm which immediately adjoins the collar is of conical form, and that part of the axle box which works therein is of corresponding figure. The box is of cast iron, and at its inner end embraces the collar on the axle arm, other parts of the box fitting upon other parts of the arm, but four longitudinal cavities being formed in the interior of the box for the reception and circulation of oil. In the outer end of the box is a female screw thread for the reception of the screwed part of a “cupped oil cap,” which is thus secured to the end of the box, the inner part of

this cap being of conical form, and having a short tube or neck projecting from it into the oil cavity of the axle arm, and conveying the supply of oil to such cavity. The wooden nave of the carriage wheel is of the usual construction and the nave and box are retained in their place upon the axle arm by there being three wrought-iron screw bolts passing from projections on the exterior of the inner end of the box, a circular plate which is placed upon a cylindrical part of the axle itself, behind the collar of the arm being provided with holes through which the three bolts pass, there being a leather washer placed between the circular plate and the back of the collar, and nuts being then screwed upon the bolts so as to draw the plate and washer tightly against the inner end of the box, such plate and washer then bearing against the back of the collar and preventing the box and nave from leaving the axle arm.

The three bolts are secured in the projections upon the axle box by being placed in the mould in suitable positions when the box is cast, and the inner ends being jagged to prevent them from being afterwards drawn out of the metal. A "guide pin," by means of which the plate and washer are always brought into one position before being screwed to the box is also connected to the box in the same manner, and passes through holes in the washer and plate provided to receive it, and in addition to the leather washer already mentioned a second washer of the same material is placed inside the collar on the axle arm, and a third upon the screw of the cupped oil cap, the escape of oil from any part of the box being thus effectually prevented. By removing the nuts from the three screws connected to the box and withdrawing the plate and washer therefrom the wheel may be easily removed from the axle arm.

[*Printed, 6d. Drawing.*]

A.D. 1830, August 31.—No. 5991.

HANSON, JOHN.—Propelling and guiding carriages. The first part of this invention has reference to a method of propelling steam carriages. The crank shaft is fitted with differential gearing and chains which pass round pinions on the axletrees. By throwing the different sizes of pinions into

gear the speed of the carriage may be regulated. The axletrees are supported in bushes or boxes working freely in horn plates and attached to the springs which latter are secured in the usual way to the framing of the carriage. By these means the wheels and axles are free to move by the springs and yet preserve the driving power unaffected. There is no claim for machinery.

Only one wheel of each pair is fast on the axle. The wheels are fitted to the axles by a species of ball and socket joint, that which is fixed to the axle being keyed through the joint. The wheels are also held in frames swivelling on the carriage and worked simultaneously by levers, so that in changing the direction of the vehicle, each one of the wheels is turned into the required direction at once.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1830, September 7.—No. 5994.

WILLIAMS, PETER.—Preventing carriage accidents. Part of this invention relates to locking or braking the wheels and part to a system of apparatus for disengaging the horses from the carriage.

For the purpose of skidding the wheels, the naves are surrounded by friction bands which, by turning a screw, may be made immediately to clip the naves and so hinder the turning of the wheel. To prevent backing ratchet projections are fitted to the nave band which come into contact with a projection on a catch piece when the latter is let down from its usual position for the purpose.

To enable the horses of pole carriages to be disengaged at will, an apparatus is attached to the carriage consisting of a rotating rod to which are hinged bolts round which the trace loops are placed. This rod may be worked by a rim or a hand lever. The crab at the pole end may similarly be released and with it the leaders. Modifications of this releasing gear are applied to the cases of single horse carriages.

In gigs and other two wheeled vehicles a prop is fitted underneath, furnished at the lower end with small wheels or rollers. This is for the purpose of keeping the shafts off the ground in case it should be necessary to release the horse.



A skid or shoe is also described. It is attached to the wheel axle by a pair of bars and may be lowered and raised at will from the vehicle.

[*Printed, 9d. Drawing.*]

A.D. 1830, September 21.—No. 6000.

CHURCH, WILLIAM.—“Certain improvements in the construction of boats and other vessels; a part of which improvements are applicable to the construction of carriages.”

This invention consists in the first place in the substitution of thin metallic plates in lieu of the ordinary framework and planking employed in building the hulls of vessels and the bodies of carriages. In order to give the requisite lateral strength to the plates of metal, they are fluted, furrowed, or otherwise corrugated, and they are united together by rivets or bolts, some of which not only unite together these plates, but also pass through and combine with them on the outside other plates or sheets of metal which are plain, and likewise bars which pass across the ridges of the corrugated plates on the inside, the joinings being carefully arranged so as to be airtight. Instead of the cross bars, plain sheets of metal may be used, and instead of the outside plain sheets, thin planks of wood may be employed, these also crossing the furrows of the corrugated sheets.

In constructing the decks and sides of vessels two thicknesses of corrugated metal, crossing each other at right angles, may be used, thus producing decks and sides of great strength. The invention is mentioned as being applicable in the construction of “carriages of various descriptions,” for which reason it is noticed here.

[*Printed, 6d. Drawing.*]

A.D. 1830, October 6.—No. 6006.

HEATON, JOHN, HEATON, WILLIAM, HEATON, GEORGE, and HEATON, REUBEN.—Steam carriages. This carriage is supported on four wheels, the two leading wheels being carried by an axis moveable round a centre pin. The conductor sits in front and by turning a winch, tightens a chain on the required side and so moves the axletree towards that side. The heavy machinery is fitted in the framing, which is sup-

ported on springs by the main wheels, their axle being curved to pass under the boiler, a curved bar also unties its ends and passes over the top of the boiler. The engines drive a cranked shaft fitted with variable toothed gearing communicating motion to another shaft also cranked. This gearing is thrown in and out by clutches from the conductor's seat, he being thus enabled to vary the speed. The motion of the second shaft is communicated by means of connecting rods, to a third crank shaft carried by supports attached to the main axle itself. The main wheels are driven from the latter shaft by toothed gearing, and the latter shaft not being influenced by the springs the gearing does not miss. The intermediate shaft is on that part of the carriage supported by springs, but the connection as described is not affected by the action of the springs.

A system of inclined teeth and catches is applied to the main wheels to allow of one moving in advance of the other in turning and also to arrange for backing the engines. The starting gear is worked by the conductor's foot, and a friction brake is also provided.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1830, November 4.—No. 6027.

**BRAMLEY, THOMAS, and PARKER, ROBERT.**—Propelling carriages, axle box, and wheels. Part of this invention which relates to the propulsion of carriages on common roads, consists firstly in constructing them with three wheels and a perch, two wheels in front and one behind. The rider lies on his breast on a saddle and propels the vehicle by means of his feet which fit into stirrups. A shoulder band holds him in position and his hands are free to steer the carriage by a hand wheel acting on the front wheels. Secondly, the system may be modified by adding a wheel and adapting the apparatus so that two men can work it. One lies as before and the other works in an erect position. The vehicles are provided with brakes.

In order to secure the wheel to the axle, instead of using the nuts and bolts, as in the ordinary mail coaches, passing from inside to outside of the nave, the inventors grip a flange on the axle between the nave and a screwed collar.

The nave and collar may also be further secured by a screwed key.

Elastic wheels are made by fitting spiral springs in each spoke. The spokes are arranged so as to diverge from the periphery to the nave. The periphery is narrow and is formed of wood in an iron channel.

[*Printed, 2s. 1d. Drawings.*]

A.D. 1830, November 4.—No. 6030.

GILLET, AUGUSTUS WHITING.—Wheels. This improvement consists in “the adaptation of what may be called a perpetual railway to carriages of different kinds, which is formed by a circular rib or rail placed round the interior of the felloe of the wheel, and upon which circular rib a small wheel with a grooved periphery is intended to run, which small wheel, bearing its portion of the burthen of the carriage, by running upon a smooth even surface greatly facilitates the progress of the carriage when the larger or running wheel passes over heavy or uneven ground.”

[*Printed, 8d. Drawing.*]

A.D. 1830, December 13.—No. 6052.

WITTY, RICHARD.—Propelling carriages. The inventor prefers to use these cylinders placed horizontally on the framing. They are single stroked, one end of each being properly closed and valved, the other open to the air. The front ends of the cylinders are closed, so that “the elastic force of the steam is exerted on the front or closed ends of the cylinders, and at the same time upon the pistons which then move in a contrary direction.” The piston rods work a cranked axle to which the wheels are fitted. To facilitate backing the centre cylinder may be made double acting, both ends in this case being, of course, closed. The object of the inventor to be attained by this apparatus is “to convert the reaction of the steam upon the ends of the cylinders into a projectile force, which force is employed in propelling the carriage” “forward or in a rectilinear direction, while at the same time the force of the piston itself is employed in producing angular or circular motion being connected to a wheel or wheels which are thus turned round.”

[*Printed, 5d. Drawing.*]

A.D. 1830, December 17.—No. 6054.

GRAHAM, AUGUSTUS. — (*A communication.*) — “Certain improvements in the application of springs to carriages.”

The object of this invention is to lessen the jolting of the bodies of carriages, “and this desirable object may be effected in various ways.” The springs may be made either of wood or of steel, and may either be attached to the perch or framework of the carriage, or to the body of the carriage, or to both, but between the springs and the perch or framework or body of the carriage, an axis or axes is or are introduced, “with necks or pivots turning in pivot holes made in the ends of the supports or crane necks attached to the perch or framework or body of the carriage,” there being fixed upon such axis or axes “either excentric or concentric wheels or pulleys of different diameter, and with bands, cords, chains, or straps to them, by means of which they are connected with the perch or framework and the body of the carriage; or, otherwise, the said axis or axes may have arms or levers of different lengths affixed upon them, from the ends of which said arms or levers links or eyes may proceed to the supports or crane necks, and thereby connect the perch or framework with the body of the carriage.”

The details of the invention may be greatly varied, in accordance with the particular construction of carriage to which it is desired to apply the invention.

[*Printed, 6d. Drawing.*]

A.D. 1831, March 4.—No. 6090.

NAPIER, DAVID, NAPIER, JAMES, and NAPIER, WILLIAM. —Propelling carriages. The “improvements in machinery for propelling locomotive carriages consist, first, in communicating the power of the engine or engines for propelling the carriage to the wheels by means of a belt, strap, or band, made of leather or any other suitable material, and which belt or band works upon two pulleys or drums, the one fixed upon a shaft connected with the engine or engines, the other fixed upon or connected with the axle or wheels of the carriage (more than one of which belts may be used if necessary).” The “second improvement is in the construction of the steam boiler or boilers.”

[*Printed, 6d. Drawing.*]

A.D. 1831, June 7.—No. 6124.

PEARSE, JOHN.—“Certain improvements on wheeled carriages, and apparatus to be used therewith.”

According to one part of this invention there are affixed to the under part of the body of a cart certain cross beams, these having attached to them iron supports formed of bars arranged lengthwise of the vehicle, but curving downwards in the middle, and there being connected to the middle of each support a screwed loop, there being jointed to the latter certain pieces by means of which the cart body is suspended upon or from the axletree. From the same points to which the loops are connected are also hung the inner ends of four bars, the outer ends of which are bolted to the under side of a wooden frame which passes below the axletree, and through gaps formed in the suspending pieces mentioned above, the shafts of the cart being attached to this frame.

The body of the cart is kept in a nearly horizontal position when descending or ascending a hill by means of four iron rods which are jointed to loops affixed upon the suspending pieces, there being attached to these rods chains, which pass underneath certain pulleys and are then affixed to the cart bottom. These pulleys are mounted upon pivots affixed to the wooden frame already mentioned, and the result of the arrangement is that on descending a hill the body of the cart is not only kept in a nearly horizontal position, but is thrown backwards, a contrary effect being produced upon a hill being ascended. And in order to preserve a parallelism between the shafts and the wheels certain jointed levers are arranged in combination with the wooden frame and the suspension pieces, and, by the aid of certain connecting rods, prevent any twisting or crossing movement between the shafts and the axletree. To the suspension pieces are, moreover, connected jointed brakes, these being likewise jointed to the body of the vehicle, and in such manner that they come into action upon the naves of the wheels when the cart is descending a hill. Another arrangement of drag or brake is described as being applicable to a four-wheeled carriage if desired, in this arrangement a brake composed of curved pieces jointed together being brought into action upon the nave of a wheel when the vehicle

is descending a hill, by means of a lever and a sliding rod carrying hooks, the breeching being connected to one of these hooks, and the result being that during the descent of the hill the breeching, coming into contact with the hind quarters of the horse, causes the rod and lever to press the brake upon the nave of the wheel, while the other hook, being the draft hook, so acts when the vehicle again arrives upon level ground as to cause the brake to be again disengaged. A certain stop, a pin and other minor details, are employed in regulating the movements of these parts. An improved axletree and box are also described, the axletree having a shoulder formed thereon near the front, and, instead of upon the back or inner end of it, as usual, the box having a corresponding shoulder formed within it, and there being a ring or flanch fitted tight upon the axletree and keeping a leather collar stationary between it and the inner end of the box, in order to retain the oil within such box; a hole passing through the side of the box as well as through the nave of the wheel for the purpose of admitting oil to the parts, a screw plug closing these holes when necessary. In another modification of this part of the invention the box has a shoulder within it, near its front end, but instead of a shoulder being formed upon the axletree a tube is introduced into the box, and prolonged towards the centre of the carriage, "and externally, so as in fact to form the "axletree," the wheel being retained thereon by means of a cylindrical pin or bolt which is passed through holes made in the parts.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1831, July 27.—No. 6142.

BANCE, JOHN.—(*A communication.*)—"An improvement in "the construction of heads or hoods for cabriolets, gigs, or "other open carriages whereof the heads or hoods are required to fold down behind the back of the seat when out "of use."

[*No Specification enrolled.*]

A.D. 1831, August 10.—No. 6150.

COCHRANE, ALEXANDER.—Propelling carriages.—The carriage described in this specification is propelled by manual

power. The person propelling sits in a rowing position and by working a lever puts in motion a cranked axle. Several persons may be so employed if desired, the several levers being united in their action on the crank shaft. The nave of each wheel is free from the end of the cranked axle, each being supported by its own guides or framing. A pin is so contrived as to drop in between them for the purpose of throwing them into gear; so that in turning the carriage round, all that is necessary to facilitate the operation is to release the wheels on one side by withdrawing the pin or bolt. In order to increase the speed the movement of a pulley on the driving shaft may be made to communicate motion to a smaller pulley on the wheel axle.

[*Printed, 9d. Drawing.*]

A.D. 1831, August 10.—No. 6151.

MASON, WILLIAM.—“Certain improvements in the construction of wheeled carriages.”

In this invention there is jointed to each outer end of an axletree bed a “Collinge’s axletree,” the latter being each united with the bed by means of a cylindrical pin or bolt passing through a hole formed at the end of the bed, and a guide piece which is secured by a screw and nut, leather washers being inserted into suitable recesses in the parts, in order to prevent escape of the oil which is applied to lubricate such parts, a hole being provided for the introduction of such oil, and this hole being provided with a screw plug. The oil is spread over the surface of the cylindrical pin or bolt by means of a side branch leading from the bottom of the hole into a groove formed around the pin, and also by means of longitudinal gaps or cavities made within the hole. The outer ends of the guide pieces, which consist in fact of arms or levers of some length, are jointed to the splinter bar by means of pins or bolts and other details similar to those employed in connecting the axletrees with the bed, the futchel or socket for the pole of the carriage being connected to the central parts of the fore axletree bed and of the splinter bar by similar means, and the swingle trees being also jointed in the same way to the splinter bar. The result of the whole arrangement is that on the swingle trees, splinter bar, and

pole of the carriage being moved either to one side or the other in order to change the direction of motion of the carriage, the axles and wheels receive a corresponding movement, the carriage being thereby turned with facility. The fore wheels of the carriage are furnished with cast iron boxes, as usual, and the springs, framing, and other parts of the vehicle may be arranged in such manner as may seem most convenient, the details of the invention being capable of modification.

[*Printed, 6d. Drawing.*]

A.D. 1831, September 5.—No. 6158.

FORRESTER, GEORGE.—Wheels. This invention consists in making wheels of a combination of wrought iron or steel and cast iron. A skeleton wheel is first constructed of either of the two former metals. It is then coated with lead or bismuth or tin or zinc and is afterwards laid in a mould which is then closed and filled with molten iron. By this means the steel or iron core is imbedded in the cast iron.

[*Printed, 5d. Drawing.*]

A.D. 1832, January 24.—No. 6213.

PALMER, GEORGE VAUGHAN.—Cart for excavating. This cart has attached to it certain apparatus for digging or loosening the earth. Round the inside of the rims of the wheel are a number of buckets or compartments into which the earth is thrown by the excavator, and is by them raised and delivered into the cart by the rotation of the wheels. These buckets, rim and tire may be made of iron in one piece. The tire or outside of the rim is, of course, smooth for road travelling. The bottom of the cart is made with folding doors through which the earth is unloaded. The excavating apparatus is raised or lowered by a chain.

[*Printed, 11d. Drawings.*]

A.D. 1832, February 9.—No. 6220.

CHURCH, WILLIAM.—Steam carriage. The first part of the invention relates to the construction of the framing. When it is built up of wooden rails they are united by slips or



clamps of iron. By this method the necessity of morticing and tenoning is obviated. The framing may also be constructed of metal rods or bars, the junctions being secured by socket joints fastened by cotters.

The invention also relates to the construction of the wheels, which are of considerable breadth and of large diameter. "They are formed by the union of several hoops of elastic wood, connected together and secured by clamps bound round the hoops which constitute the felly or rim. The outer periphery of the wheel is bound by a hoop of iron forming a tire; and the spokes consist of elastic curved plates of steel or springs bending and moving upon joints. The outer ends of all the elastic spokes are attached to the felly by joints at the backs of the several clamps, and the reverse ends of these elastic spokes are connected by joints to a pair of metallic rings firmly fixed by radial and diagonal rods to the nave or metal box of the wheel in the centre. These running wheels are fixed upon short rotary axles and the weight of the carriage bearing upon these axles causes the peripheries of the wheels to bend into slightly oblate figures or flatted curves as they pass over the road. This deviation from the circular figure of the wheel, by its increased surface causes the wheel to take more firm hold of the ground, and consequently to be less liable to slip round or sink into the road. The springs thus introduced into the wheels, it may be observed, serve as substitutes of the springs usually employed. But in order to afford greater elasticity," the patentee makes use of an air cylinder, the piston rod of which holds the short axles. To prevent lateral movement of these axles, rods are jointed to the framework and to the axles. Another rod is connected with the inside of the wheel axle by a ball and socket joint, which holds the axle endwise. By means of these rods the carriage can vibrate vertically only. Oil or water is used to pack the piston.

The working power is communicated to a crank shaft in the usual way. A chain pulley on the shaft drives the running wheel by means of an endless chain carried over a similar pulley on each of the axles of the running wheels. The speed may be varied by introducing differential pulleys worked by clutches.

[*Printed, 4s. 4d. Drawings.*]

A.D. 1832, March 8.—No. 6241.

GIBBS, JOSEPH, and CHAPLIN, WILLIAM.—“Certain improvements in wheeled carriages, and in the means of constructing or making the same.”

The first part of this invention relates to so arranging the wheels and axles of a carriage as to facilitate the turning of the carriage. Each wheel is mounted upon a short shaft or axle, carried by an upright shaft which is placed in sockets or loops fixed to an upright standard, or to some part of the carriage framing. The springs of the carriage, which are connected to the under part of the body of the carriage by screw bolts and shackles, have circular holes in their centres, through which holes the lower parts of the upright shafts pass, collets or washers being then placed upon such shafts, below the springs, there being then placed upon such collets arms or levers, which the patentee calls guiding levers. The inner portion of the pole of the carriage is placed within two square sockets, one of which is connected with the splinter bar and the other with the upper end of a cylindrical shaft or axis placed in sockets or loops affixed to the front of the body of the carriage, a central diagonal brace connected with the splinter bar descending to the lower end of the upright shaft or axis, and thence spreading out on each side and forming a double-armed lever, to each end of which is jointed a connecting rod, these connecting rods being jointed to certain sliding rods, in combination with other connecting rods which are jointed to the ends of the guiding levers, the result of the whole arrangement being that when the pole of the carriage is moved to the right or the left in turning the carriage the axles and wheels are brought into positions corresponding therewith. Another modification of this arrangement is set forth in which two double armed levers are used, which are connected by crossed chains, the sliding and connecting rods being in this case dispensed with. Another modification of this part of the invention is described in which the upright shafts are connected with “telegraph” springs by “stirrup shaped parts.” In another arrangement each of the guiding arms or levers is formed in one piece with its upright shaft, and so bent as to facilitate its junction with either the sliding rods or the chains mentioned above.

In another part of the invention two wooden perches are placed under the body of the carriage, iron plates, and wooden blocks or stays, forming two beds, at the ends of which the axletrees of the fore and hind wheels are fixed by means of the stirrup-shaped parts mentioned above.

Another part of the invention relates to framing the bodies of carriages, and consists in introducing rods of metal into the wooden panels in place of the ordinary ribs and standards, the panels being combined in various modes, as, for instance, by means of angular pieces of metal, slips, &c. The bending of the panels, when necessary, is facilitated by cutting gaps or notches across them previously to boring the holes to receive the metal rods, and where the panel is in more than one piece the rods may be furnished with screws, or with screws and heads, or other such arrangements for securing the parts together.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1832, April 13.—No. 6258.

ROBERTS, RICHARD.—Steam carriage. Part of this invention relates to a method of arranging the driving gear with the object of allowing for unequal rotation of the wheels on one axle, for instance, in turning the carriage to one side or the other. The wheels are driven by pitch chains from pinions on the crank shaft. The wheel axle is in two parts, so that either wheel can revolve independently. The pinions on the driving shaft are fitted with bevel wheels, but are not keyed to the shaft. Between them is a carrier or third bevel wheel mounted on an arm projecting at right angles from the cranked driving shaft. As the shaft rotates, this carrier causes the bevel wheels and consequently the chain pinions to rotate, but if one wheel turn rather more quickly than the other, the carrier is simply turned somewhat on its axis. A modification of this principle is shown, consisting of spur gearing.

A steam cylinder is fitted to the carriage for the purpose of tightening a friction band round a disc on the driving shaft, for the purpose of acting on a brake.

The peripheries of the wheels are made of two pieces of angle iron rivetted face to face on the tee ends of the spokes. The latter are shouldered where they fit into a rabbet round

the nave, and a wrought iron ring is shrunk on each end of the nave over the projecting shoulders of the spokes.

[*Printed, 8d. Drawing.*]

A.D. 1832, August 15.—No. 6297.

JAMES, WILLIAM HENRY.—Steam carriage. The driving gear of this carriage is on the following plan. On the crank shaft of the engine are keyed three pinions for driving pitch chains. All these are of different sizes. Above the crank shaft is an intermediate shaft carrying also three pinions, but of equal size and loose on the shaft. Each one of the latter group of pinions may be thrown into gear by clutches with any one of the former group, and as the former pinions are of varying sizes, the speed will be proportioned accordingly. At the extremities of the intermediate shaft are other pinions carrying pitch chains which drive pinions on the hind axle. The clutch apparatus is worked by pedals from the conductor's place.

The steering is effected by turning a winch in front of the carriage. This in its turn, by means of gearing, rotates a horizontal screwed shaft, upon which are two nuts attached by bars to the fore axle. The movement of these nuts along the screwed shaft turns the leading wheels as desired. The operation of steering, however, also releases the driving power from the wheel on the inner track.

The conductor is able to stop the carriage at pleasure. Friction bands are also applied to the wheels as brakes, and these are under his control. The fire is urged by a blowing apparatus. A steam signal trumpet is fitted to the carriage. The patentee also describes improved boiler and pumps.

[*Printed, 2s. Drawings.*]

A.D. 1832, September 22.—No. 6310.

GIBBS, JOSEPH, and APPLEGATH, AUGUSTUS.—“Improve-  
“ments in machinery for cutting out wood for carriage wheels,  
“and for cutting and shaping the wheels.”

According to the first part of this invention, the stock or nave of the wheel having been turned, and the central hole bored therein in the usual manner, is placed upon an upright spindle or mandril which is furnished with a dividing plate

having grooves or divisions radiating from the centre which serve to regulate the positions of the mortice holes, a detent pin, carried by a bar which moves backwards and forwards, entering first one groove and then another as the dividing plate is moved round, and holding the stock or nave in position while being operated upon by boring bits. The nave is moved round at intervals by a friction roller, and when one set of holes has been bored in the nave, it is raised by means of a screw and nuts, and a second set of holes bored therein, "and in this" manner any additional circles of holes may be made." One part of the machine is moveable, and may be placed at different angles with the other parts if requisite, so that the holes in the nave may be bored at such angles as may be desired.

Another machine is described, in which two circular saws are employed to cut the tenons of the stock ends of the spokes, the rough spokes being supplied, during the operation, by moveable carriages mounted upon a sliding bed, and directed during the operation by certain gearing adapted for the purpose.

Another machine is set forth as being adapted for shaping the spokes, which is effected by the employment of a cylindrical cutter mounted upon a moveable carriage, and other apparatus combined therewith, a "pattern spoke" being so arranged as to control the operation. Another machine is described, in which circular saws are made to form the outer tenons, or those at the ends of the spokes, and also slits in the ends of the spokes for the reception of wedges; and other machines are set forth as being suitable for boring the dowell holes in the ends of the felloes, the holes in the felloes for the reception of the spokes, and shaping the sides of the felloes, these machines embracing various arrangements of mechanism for giving motion to boring bits and saws by which these operations are effected. The details of all these machines are very fully set forth, but will only be understood with the aid of the drawings annexed to the Specification.

[*Printed, 2s. 10d. Drawings.*]

A.D. 1852, September 29.—No. 6318.

GIBBS, JOSEPH, and APPELGATH, AUGUSTUS.—Steam carriage. This carriage is supported upon three wheels, two

driving wheels in rear and one steering wheel in front. The cylinders oscillate on steam trunnions, the piston rods working up and down in guides. They turn cranks at right angles to each other, and the latter in turn rotate toothed pinions. These are capable of gearing with pinions on the wheel axle, and as they are of different sizes the speed may be varied according to the proportions of the pair in gear. The axis of the former pinions is connected with that of the latter, that is the axle, by means of bars. By this means the wheels are always kept at the proper distance apart, and although the carriage is hung on springs, still the pinions can only move axially one to the other. The pinions on the axle are thrown in and out of gear by clutch apparatus.

The steering is effected in the ordinary way by means of a handle on a vertical shaft turning toothed pinions, and so moving the leading wheel. The latter is fitted with elliptical springs. The conductor's seat is over the water tank.

The specification also shows this carriage propelling a passenger coach. In this case the two are connected by an iron bar or perch, the steering wheel being removed from the steam carriage to the coach. It also shows such a carriage engaged in hauling trucks. In this case the steering wheel is retained, the engine preceding the trucks.

The invention also relates to engines and boilers.

[*Printed, 1s. 9d. Drawings.*]

A.D. 1832, December 20.—No. 6351.

SAXTON, JOSEPH.—Propelling carriages.—For this purpose rope traction is employed, and the object of the inventor is to provide for a speed in the carriage greater than that of the endless propelling rope.

For this purpose the latter is passed round a differential pulley or drum, that is to say, a pulley or drum having two channels or grooves one smaller in diameter than the other. The upper part of the horizontal endless rope is passed round the smaller pulley, the lower part round the larger pulley. The effect of this arrangement, according to the inventor, is to create a tendency in the pulleys to turn on a mean point situated between the ends of the two diameters. By this tendency the true centre of the two pulleys is moved horizontally a considerable

distance in proportion to the travel of the rope. This movement of the true centre is made use of to propel the carriage.

The pulleys are fitted in front of the carriage, and one of them may be released from the other when it is desired to arrest the propulsion. In one arrangement the smaller pulley works also on one of the carriage wheels. The endless rope passes over supporting pulleys, and is kept tight by weights.

[*Printed, 9d. Drawing.*]

A.D. 1833, January 29.—No. 6377.

REEDHEAD, JOHN.—Fore carriage, axles, and brake.—The wheels are on separate short axles. Each axle is fixed in the nave of its wheel, and turns with it. It turns inside a short axle box which practically forms a short axletree. This axle box is fitted with antifriction rollers against which the axles turn, and proper arrangements for lubrication. The axle boxes of the fore wheels swivel on their centres, pins passing through them for the purpose. These pins have eyes through which the axles pass. Each axle box is connected by bars with a splinter bar, consequently each horse of the pair of wheelers is attached to a separate splinter bar, and as he turns to right or left he correspondingly swivels the pivotted splinter bar, and with it the axle box. The splinter bars are connected by rods with the pole frame, so as to preserve uniformity of motion. The axle boxes and their splinter bars thus constitute two systems of parallel motion. By this means greater locking power is claimed to result, and larger wheels may be used. As a brake the patentee fits a brake drum to the spokes of a hind wheel, and surrounds it by a brake band operated by the guard. The brake may also be applied to a fore wheel, and is then adapted to move with the wheel as it locks. In this case the coachman makes use of it when necessary.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1833, February 21.—No. 6390.

GORDON, ALEXANDER.—Steam carriage. The carriage described in this Specification is supported on four wheels, the two front wheels being carried by an under carriage for the purpose of guiding the vehicle. The two hind wheels are

drawn by means of a cranked axle with which they are connected by clutch apparatus. The carriage framing is supported on the hind wheels by springs. The cylinders are horizontal, bolted down to the framing, and are worked by valves of the patentee's invention. The piston rods work with friction rollers in guides. The bearings of the cranked axle are stayed to the framing so as to maintain the relative positions of the crank shaft and the valves.

The invention also relates to improvements in boilers and condensers which may be applied to steam carriages.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1833, April 4.—No. 6406.

BOYS, EDWARD, junior.—“A machine or apparatus for preventing accidents with carriages in descending hills, or in other perilous situations.”

In this invention a skid pan is connected with a base on which rest the lower ends of two arms which ascend diagonally, and are joined at the upper ends, being there also jointed to the shorter arm of a lever which is mounted on a fulcrum carried by a bearing supported by one of the axles of the vehicle. A chain passes from one of the arms to the under side of the lever, this being meant to give strength to the apparatus, and from the end of the longer arm of the lever passes a strap or band which proceeds to a roller or windlass, the latter being of two diameters, and having also connected therewith a second strap which is attached to the end of an arm fixed to the upper ends or point of junction of the diagonal arms first mentioned. The different diameters of the roller or windlass are meant to accord with the different spaces which have to be moved through by the points to which the straps are attached, the roller or windlass being turned by any convenient means when it is desired to apply the skid, and the result being that the diagonal arms press the skid pan upon the ground. To the base with which the skid pan is connected is attached one end of a rod or chain which answers the purpose of an ordinary drag chain, and the arrangement may be varied by placing the lever and straps in different positions, the patentee recommending that in some cases, in addition to the apparatus mentioned above, there should be placed on the opposite side of



the vehicle a second skid pan with base and diagonal arms, but without the lever, such skid pan being brought into operation by merely unhooking a chain, strap, or cord, which at other times keeps it from the ground.

[*Printed, 8d. Drawing.*]

A.D. 1833, May 2.—No. 6415.

COLLINGE, CHARLES.—“An improvement or improvements  
“ in the making or manufacturing of axletrees.”

This invention relates to improvements in the manufacture of boxes and axletrees, for which a patent was granted to John Collinge, the father of the present patentee, the latter stating that in the formation of such boxes great loss has been sustained by their cracking when they were heated red hot and plunged into water to harden their inside surfaces, this evil arising from the unequal dimensions of the head and the body of the box, as well as “the peculiar quality of the metal” employed, such metal being cast iron. According to the present invention the body of the box is formed of wrought iron “scrolled and welded in a similar manner to that adopted in “the manufacture of twisted gun barrels,” the interior being then carefully bored out, and the inner surface case-hardened. The head of the box is formed of cast-iron, and not subjected to the process of hardening, and in the arrangement described the head and body of the box are connected by the head being in the first place decarbonized and softened, and the body of the box being then turned down to some distance from one end, and into a slightly conical form, the larger part being at the end, and the cast-iron head being then heated so as to be expanded sufficiently to pass over such larger part, and then placed upon the turned down end of the body, being then allowed to shrink thereon, and the two parts thus becoming firmly united.

Before the heated cast-iron head is placed upon the body of the box the latter should be set upright, the lower end having been previously stopped by a cap or other means, and the body should then be filled with cold water, which will prevent it from being softened by the heat of the head. After the head is placed upon the body, the internal shoulder of the head and

other parts must be turned and finished by the usual means. Another mode of uniting the head and body is described as consisting in screwing them together, the parts being immovably fixed by a solution of sal-ammoniac being placed between them, or by heating the head and allowing it to contract upon the body as in the first arrangement.

[*Printed, 7d. Drawing.*]

A.D. 1833, August 7.—No. 6456.

REES, DAVID.—“Improvements in drags or apparatus to be “ applied to carriages.”

This invention relates to several arrangements of drags for carriages. In one arrangement a drag or shoe is jointed at one end to a lever or frame jointed to the hind axle of the carriage, there being connected to the lever or frame a strap or chain which passes upwards to the seat of the driver or that of the guard (if the apparatus be applied to a coach), and is there secured by a catch when the drag is not required to act, the lever and drag being then raised into such a position that the drag is some distance from the ground. By releasing the strap or chain from the catch, however, the lever and drag are allowed to fall, the latter passes under one of the wheels of the vehicle, being restrained from passing too far by a drag chain of the usual character.

Another arrangement is described in which the drag, instead of being jointed to the lever or frame at one end, is jointed thereto about midway of its length. In both these arrangements the carriage must be backed, as usual, before the drag can be released from the wheel, but another arrangement is described in which the drag may be drawn up while the carriage is in motion, this being effected by the application to the drag of a catch, which upon being liberated from a certain latch has the effect of causing the wheel of the carriage to lease the drag and again come into contact with the ground, allowing the drag to be raised without difficulty. The catch is liberated by pulling at a strap attached to the eye of a lever, the movement of the latter setting free the catch.

[*Printed, 6d. Drawing.*]

A.D. 1833, October 28.—No. 6494.

REDMUND, DAVID. — Wheels. Such of the improvements under this invention which relate to wheels are thus described by the patentee :—

“ I construct mine for the most part of malleable cast iron.”  
For Lorn pig “ I sometimes substitute what is called ‘ refined  
“ ‘ or forge iron (in the state of preparation to which it is  
“ ‘ brought previously to puddling or tilting’). This iron  
“ when cast I subject to a bright red or the ordinary anneal-  
“ ing heat for about eighty-four hours, when it will be found  
“ sufficiently tough and malleable. I cast the nave of my  
“ wheel hollow to admit the axletree box and to form a cavity  
“ for oil, with a fixed flange in the outer surface of which are as  
“ many semi-cylindrical cavities as there are to be spokes.  
“ A corresponding loose flange, with the same number of  
“ hollows on its inner face, with a circular central aperture,  
“ fits over the boss of the nave, and when bolted to the face  
“ of the fixed flange, completes the cylindrical sockets for  
“ the central ends of the spokes. These sockets may be  
“ cleaned out by a half round bit. For steam carriages the  
“ inner end of the nave is prolonged to admit a chain wheel  
“ or other driving gear to be keyed upon it; an axletree box  
“ of the ordinary kind is driven tight into the central aper-  
“ ture of the nave, and provision made by small perforations  
“ in the box to admit the oil from the oil chamber to pass  
“ the rubbing surfaces. The spokes of my wheel are hollow,  
“ cast from the Lorn pig, and converted to the malleable state.  
“ The general form of the shaft of the spoke may be conical  
“ or cylindrical, but when less strength is necessary, I form  
“ them as if the hollow shaft has been slit through a portion  
“ of its length, and each half curved outwards.” Then the  
wheel is made elastic and ornamental. “ The spokes near  
“ their outward extremities have a shoulder, beyond which  
“ they are turned cylindrical on the outside and tapped  
“ within. The felloes are cast in segments, and in corre-  
“ spondence with each spoke there is a boss which is bored  
“ true to receive the end of it, and comes down upon the  
“ shoulder of the spoke. In putting on the felloes, a pin or  
“ bolt at the heading joints holds them in their places until  
“ the rim or inner tire comes on, which, being shrunk upon

“ the felloes, holds all firmly together. This rim tire must  
 “ be bored opposite the hollow ends of each spoke, and the  
 “ holes countersunk to admit the screws which connect more  
 “ firmly the spokes, felloes, and inner tire. The outer or  
 “ wearing tire I put on in segments, and fix in its place by  
 “ bolts passed through the felloes and both tires, and drawn  
 “ down, by nuts on their inner ends. A space of about half  
 “ an inch should be left at each heading joint of the outer  
 “ tire to allow of the extension of the metal under wear.  
 “ When the outer tire is worn down it may be readily re-  
 “ placed. When the ornamental or split spokes are used, a  
 “ tube with a cap or plug may be inserted in one of them to  
 “ convey oil to the oil chamber in the nave, otherwise a screw  
 “ hole may be made into the chamber in any convenient  
 “ situation. To prevent the spokes turning in their sockets  
 “ in the nave, it is advisable to fix them by steady pins  
 “ through one of the flanges ; they may or may not be filleted  
 “ within the socket.”

[*Printed, 1s. 9d. Drawings.*]

A.D. 1833, December 20.—No. 6529.

QUAINTIN, LOUIS.—“ Certain improvements in the construc-  
 “ tion of carriages.”

One part of this invention relates to a mode of lubricating the arms of the axles of carriages, and consists in the employment of “ several reservoirs of oil, grooves, and canals, which  
 “ communicate with one another by a main canal. One of  
 “ these reservoirs is placed at the collar of the arm, in the  
 “ box ; and another is a cap which is screwed into the box at  
 “ the end of the arm, along which arm a canal or conduit is  
 “ made, which forms a communication between the two first  
 “ reservoirs. By means of this contrivance the whole length  
 “ of the arm is constantly bathed in oil, which is incessantly  
 “ sent from one reservoir to the other by the motion of the  
 “ wheels during their rotation, consequently no fear need in  
 “ future be entertained either for the unequal wear of the  
 “ arms, or for the naves becoming heated by the dry friction,  
 “ as is frequently the case with ordinary axles and boxes.”  
 These arrangements are set forth in detail, and their effects explained.

Another part of the invention relates to a brake for carriages, and consists in the first place of a bar capable of sliding to and fro beneath the body of the carriage, this bar having at its hinder end a cross bar carrying brakes, which when the bar is drawn forward are pressed against the hinder wheels of the vehicle. This bar is acted upon when necessary by chains connected with a roller so placed as to be easily turned by a handle near the driver's seat, and also with a rod capable of sliding on the pole of the vehicle, the outer end of which forms a hook to which the harness of the fore horses is attached, the result of the whole arrangement being that on turning the handle in one direction not only is the bar carrying the brakes drawn forward so as to bring them into contact with the wheels, but the sliding rod on the pole is drawn backwards, a certain ring being now removed from certain guiding pieces placed on the pole near the rod, and the tractive power of the leading horses aiding in applying the brakes. On the handle being released the parts are returned into their first position by means of certain spiral springs, one of which is coiled round the pole, and the other connected with the apparatus at the back of the vehicle. Instead of a roller and handle for bringing the apparatus into action a "tread wheel" may be employed, being brought into action by the feet of the driver of the vehicle.

Another part of the invention relates to the building of carriages, and is thus set forth:—

"This new description of carriage is particularly distinguished from those that have been built in Europe up to the present day, by the strength of the timber of which it is built, and the manner in which it is ironed. The timber of which this carriage is built is partly of this country, and partly foreign, such as the stinking wood, black wood, &c. These latter give the carriage strength and lightness at the same time. With respect to the iron work, it is applied in the least perceptible manner, and in the places where the carriage suffers most straining." The patentee states that he has not furnished any drawing in illustration of this part of the invention, as he intends "to apply it to all sorts of carriages."

Another part of the invention relates to a mode of detaching

horses from a carriage in case such horses should run away. The arrangement employed consists in the first place of a rein, "which goes from the body and descends to the level of the shafts, where it divides in two, each of its ends taking a spring to which is affixed the iron work that holds the trace, the end of which enters the shaft and upon which the horse exerts his strength to draw the carriage; by means of two rollers the trace is allowed to pass and freely when the spring is drawn back to detach the horse when running away." At the back band the patentee proposes to place two hooks, "which in drawing horizontally would hold up the shafts," but on the traces being loosened and falling perpendicularly would "cause the hooks to open by the help of two rollers and two springs," the breeching being "fixed partly to the back band and partly to the traces. It can be imagined that the traces becoming loosened by the rein which goes to the body the remainder would detach itself by the weight of the shafts."

Another part of the invention relates to a species of carriage which the patentee calls the "precaution," and which is meant for use in carrying on war with the more savage races of mankind. This part of the invention consists essentially in "a cuirass, musket-proof, mounted on a simple four-wheel carriage, sheltering those enclosed in it from head to foot, moving and governed by the latter, and in which is united every means of defence, internally and externally, in guns and pikes."

Another part of the invention relates to vehicles "which are to be propelled by the weight they carry," certain arrangements of wheels, pinions, catches, air-pumps, and other apparatus, being set forth as applicable in carrying out this part of the invention, the goods or other articles to be carried being placed in cylinders, it being stated that the changing of the position of these cylinders "causes the carriages to be propelled."

[*Printed, 2s. 11d. Drawings.*]

A.D. 1833, December 20.—No. 6532.

PIERSON, JOSIAH GILBERT.—"Certain improvements in the construction of bolts and latches to be attached to doors

“ and other situations where a secure fastening may be required.”

This invention consists in “several novel features” adapted to the fastening of doors, &c.; but relates principally to the employment of a series of peculiarly formed sliding pieces, which the patentee proposes to call “the web of the lock,” such pieces being “used for confining and securing the bolt or latch, and preventing its being moved back by any other implement in the absence of the key which has been fitted and adapted to its particular use.”

The details of the invention are set forth at some length, and will not be understood without the aid of the drawings annexed to the Specification; the patentee claiming particularly the adaptation of changeable sliding web pieces for locking or confining the bolts or latches, rendering the interior of the lock inaccessible by securing the face plate through the agency of bolt and key; and also the construction of a staple which receives the tongue of a bolt adapted to it.

[*Printed, 1s. Drawings.*]

A.D. 1834, January 13.—No. 6540.

TIGAR, PINNOCK.—Wheels. These wheels, which are made of metal, are constructed upon the principle of suspension and support combined. For the purpose of enabling this principle to be put into effect, the spokes are screwed both into the nave and felloe. The outer ends of the spokes may be made square for the purpose of facilitating the screwing, the square ends being subsequently cut off smoothly with the periphery. The spokes may be solid or tubular and in the latter case may have a wood core. They may be arranged in different ways and are screwed into a metal nave.

[*Printed, 9d. Drawings.*]

A.D. 1834, January 25.—No. 6550.

HICK, BENJAMIN.—“Certain improvements in locomotive steam carriages, parts of which improvements are applicable to ordinary carriages and to steam engines employed for other uses.”

[*No Specification enrolled.*]

A.D. 1834, March 29.—No. 6585.

DOUGLAS, JOHN COOPER.—Propelling carriages. The motive power which the inventor claims to use for this purpose is to be derived from the alternate action of atmospheric pressure on two pistons contained in one cylinder and separated by a diaphragm. The cylinder is carried in a frame which moves to and fro horizontally in guides. To it is attached a double rack which in these reciprocations, works toothed segments from which the motive power is applied.

The specification also shows a carriage fitted with this apparatus. The latter is applied to the perch under the carriage. In this carriage the seats at the back are raised above those in front.

The invention also relates to a method of preventing overturning of carriages. The apparatus for this purpose consists of a pair of levers crossing one another under the carriage and pivotted near their ends. The long arms of the levers are attached to opposite sides of the carriage near the bottom. The short arms have bars extending from them upwards to the sides of the body immediately above them.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1834, March 31.—No. 6588.

MILLICHAP, GEORGE.—“Certain improvements on loco-  
“ motive machines or carriages.”

In this invention there is supported upon a raised framework a certain shaft or axis on which are fixed two spur wheels, one of these being much larger than the other, and there being at each end of this shaft or axis a winch or handle by which rotary motion may, if desired, be communicated to such shaft or axis and wheels. This rotary motion may be given to the shaft by means of manual labour, or a steam engine may be employed to rotate the shaft, there being upon the axes of the bearing wheels of the carriage other toothed wheels of different diameters, these corresponding with the toothed wheels first mentioned, and the shaft or axis on which these wheels are fixed being so arranged as to slide to and fro in its bearings, the different wheels being thus placed into and out of gear with each other, and the power and speed of the mechanism being thus varied. The fore part of the framing



of the carriage is connected with the front part by means of an axis and bearings so arranged that in case one of the wheels of the vehicle should rise over an obstacle in the road the two parts of the framing of the vehicle adapt themselves thereto. And in the first part of the framing is mounted steering or guiding apparatus, the fore wheels of the vehicle "turning with a locking motion similar to ordinary carriages," a winch and certain gearing enabling the conductor of the vehicle to guide the latter as requisite.

[*Printed, 11d. Drawings.*]

A.D. 1834, July 3.—No. 6637.

HARDY, JAMES.—"A certain improvement or certain improvements in the making or manufacturing of axletrees for carriages."

[*No Specification enrolled.*]

1834, A.D. September 25.—No. 6679.

TONGUE, CORNELIUS.—"Certain improvements in apparatus for preventing accidents to travelling carriages of various descriptions."

In this invention an arm or lever is jointed at its upper end to a plate of metal fixed to the axle of a carriage or in some other convenient situation, and is curved and forked at the lower end, and has jointed to such forked part a drag, the latter being furnished with projections which facilitate its being jointed to the lever or arm. The fore end of the drag is formed into a loop or hoop, whereby it may be connected with a chain of the usual kind, and towards the other end of the drag, and on each side thereof, are projections which serve as guides to assist in conducting the drag to its proper position beneath the wheel when required to impede the progress of the carriage. A chain connected to the lever is carried upwards and onwards, and directed by means of rollers to the seat of the driver of the vehicle, or to that of the guard, or if desired to the interior of the carriage, the end of the chain being placed upon a hook or knob when it is desired to keep the drag out of action, the drag being then raised from the ground; but on releasing the chain from such hook or knob the lever falls and allows the drag to pass under

the wheel, the chain already mentioned as being attached to the nose of the drag, and which chain is also connected to the fore part of the carriage, preventing the drag from passing too far under the wheel. More than one drag may be applied to a vehicle if desired.

[*Printed, 5d. Drawing.*]

A.D. 1834, October 8.—No. 6689.

HICK, BENJAMIN.—Locomotive and wheels. Part of this invention relates to the construction of a steam carriage or locomotive, that described in the specification being intended to run upon a railway. The cylinders which are “overhead” receive steam on the upper side of the pistons only, from which arrangement it is claimed that greater freedom from vibration and better adhesion result. Differential gearing with suitable disconnecting clutches, is fitted to the driving axle.

Wheels for common road and other purposes are made with iron naves and rims connected by iron discs. These discs are bolted to flanges on the nave and are fitted and held in angle recesses in the rim.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1834, November 4.—No. 6707.

GIBBS, JOSEPH.—“Certain improvements in carriages, and in “wheels for carriages.”

This invention relates to “a peculiar arrangement of the “spokes and naves of wheels, whereby wheels may be constructed with greater facility” than according to the ordinary system. The nave is of metal, and also constitutes the axle box, and the spokes of the wheel are so arranged that the end of one spoke is near one end of the nave while the end of the next is near the other end thereof. The spokes thus appear, “when the wheel is viewed edgewise, to form “the two sides of an isosceles triangle, of which the nave “represents the base,” the spokes, however, being placed at equal distances asunder in the felloes of the wheel. The spokes may be so formed at the inner ends as to “just fill “in and wedge one another,” or there may be longitudinal grooves cut or cast on the outer surface of the nave or axle

box for the reception of the inner ends of the spokes. The outer ends of the spokes are inserted into mortices in the felloes of the wheel, and there are certain plates and screws so arranged that by tightening the screws, the plates being drawn nearer together, cause the spokes to expand the felloes "and make the whole wheel more rigidly secured," one of these plates being easily removeable for the purpose of removing and replacing a faulty or imperfect spoke. The spokes may be expanded, according to another modification of the invention, by means of a central cone around which their inner ends are placed, such cone being adjustable by means of screws or bolts.

The invention also embraces an arrangement of springs for carriages in which spiral springs are each connected at one end to a shaft or axis and at the other to the interior of a drum or barrel, there being wound around these barrels straps of leather which are connected at one end with the barrels and at the other with supporting rods which are connected with the shafts or some other convenient parts of the carriage. And in order to prevent the shaft or axis to which the springs are connected from turning round, and also to prevent the carriage from rising and falling in an improper direction, certain flat bars of steel are connected at one end with the shaft or axis and at the other with the shafts or framing of the vehicle.

[*Printed, 10d. Drawings.*]

A.D. 1834, November 20.—No. 6719.

WHITESIDE, ROBERT.—Wheels for steam carriages. The springs are placed within the wheels in order that the relation between the engine and the axle may be uniformly maintained. They are spiral and are attached by their outward ends to four equidistant points on the inside of the periphery, and at their inner ends to the axle box which passes through a ring of a diameter sufficient to allow for the play of the springs. The spokes of the wheel are secured in this ring. Between the above-mentioned equi-distant points two square frames are fitted, one within the other. The outer one may move to and fro in one direction, the inner one to and fro in the direction at right angles, the latter being in fact carried by the former. To the latter an iron plate is attached, having a

central aperture for the insertion of the axle box which is secured to it. The axle box is thus inside the inner ring of the wheel, but is not attached to it in any way. The twisting force of the machinery is thus not liable to tear the springs from their place.

The invention also relates to a method of packing and lubricating rotary engines which may be used for propelling carriages and other purposes.

[*Printed, 9d. Drawings.*]

A.D. 1834, November 25.—No. 6722.

BARLOW, ROBERT JOSEPH. — “Certain improvements in “ springs applicable to carriages and other purposes.”

This invention consists “in the use of springs having very “ little elastic play,” the patentee stating that he is thus “ enabled to construct springs and use materials much lighter “ and cheaper and more easily replaced and repaired than “ heretofore,” the elastic play obtained being, moreover, multiplied to any required extent “through the medium of “ two arms of unequal lengths, causing the shorter arm to “ act upon the spring and the longer arm to sustain the “ carriage or other weight for which elastic play may be “ required.”

An arrangement is described in which a recess or mortice is formed in the framing of the carriage to receive six short pieces of spring plate, these plates being divided into two sets, which are kept apart by iron stops, the latter being retained in position by flanches. “The plates of each set or spring “ lie one on the other without requiring any fastenings,” the recess or mortice in the framing of the carriage being suitably shaped for the reception of the spring plates. A bolt of iron or steel is placed above and another below the springs, and levers are so arranged that when the outer ends thereof are acted upon by the weight of the carriage a “nipping action” is exercised upon the two sets of springs. These arrangements may be variously modified, in some cases one set of springs only being used, while in others a cushion or bag of atmospheric air is used instead of springs. And the invention may be applied not only to wheeled carriages, but also to the hanging of the seats of easy chairs, and to sedans.

[*Printed, 1s. 9d. Drawing.*]

A.D. 1834, December 23.—No. 6733.

HANSOM, JOSEPH. — Improved carriages. One form of carriage described in this Specification is supported on two large wheels which are attached to the carriage body by short spindles. The inner ends of the spindles fit into boxes in the framing; the outer ends are fitted into the naves of the wheels. The shafts “are on a level or nearly so with the centres of the wheels and also with the centre of the main body part of the carriage.”

Another form of carriage is supported by a pair of wheels or rather rings, which completely surround the body and turn on friction rollers or their equivalents, attached to the transoms. This carriage is shown as being capable of accommodating four persons. The shafts are similarly arranged to those of the first-mentioned vehicle.

The invention also relates to a method of hanging a cart body from the axletree in such a way that it can be lowered to the ground if desired. The axletree is fitted with a lever, from the short end of which the body is suspended. The other end being drawn down by a rope passing round a drum attached to the shafts the body is raised, and when relieved the lever allows the body to fall to the ground.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1835, February 25.—No. 6772.

AITKEN, WILLIAM. — “Certain improvements in the construction of carriages to be propelled by animal or other power.”

An arrangement is described in which a carriage frame is in the first instance formed of oblong rectangular shape, and strengthened by cross bars. Across the under side of the frame, about midway, is fixed an axletree, and on each side of the side bars of the carriage frame, are iron staples or eyes, two or more on each bar, secured by screws or bolts, on which hang as many coiled steel springs. On each pair of springs hangs a strong cross bar, so formed at each end as to catch into a loop or eye at the lower end of each spring, and in these cross bars the body of the carriage rests. The carriage frame is mainly borne by two wheels of large diameter, a third subsidiary wheel, however, of much smaller diameter,

being attached to a revolving frame which is placed under the fore part of the carriage frame, and swivels on a centre pin.

In order to prevent the carriage from being tilted up by the occasional preponderance of the load behind the axletree, the patentee employs a stay, "beneath the hind parts of the "carriage," which, carrying a small roller having vertical play under the pressure of a spiral spring, "will give occasional support without impeding the onward motion of "the vehicle; or the stay may be used without a spiral "spring, the springs supporting the carriage acting for the "accomplishment of the object."

The details of the invention are set forth at some length, and include a brake by which the progress of a carriage may be checked when travelling down hill, or when the horses become unmanageable; means of facilitating the changing of the horse or horses employed in drawing vehicles are also described, as well as various means of liberating such horse or horses from such vehicles, pulleys, ropes, brake levers, and other mechanism being also engaged in carrying out the invention.

[*Printed, 2s. 5d. Drawings.*]

A.D. 1835, February 25.—No. 6773.

HYNES, PATRICK SEYTON. — "Certain improvements in "wheels, axletrees, and boxes, and in and apparatus for "retarding or locking carriage wheels."

According to one part of this invention the axletree of a carriage is furnished with shoulders or enlargements of peculiar form, through which are passed bolts which are furnished with springs tending to press them constantly in one direction, or towards the naves of the wheels, cords or chains, however, being connected with the bolts, which are passed round pulleys carried by bridges or brackets screwed to the axletree, and are then led to some convenient parts of the carriage, and then secured to hooks or holdfasts. Strong plates of gun metal or wrought iron are affixed to the inner ends of the naves, and in these plates are holes or recesses for the reception of the ends of the bolts, the result of the arrangement being that on the cords or chains being liberated from the hooks or

holdfasts the springs press the bolts into the holes or recesses in the plates, thus stopping the rotation of the wheels, and consequently the progress of the carriage. In order to protect the tires of the wheels from extra wear when this apparatus is brought into action plates of soft steel or case-hardened iron are let into the tires at points corresponding with the recesses in the plates in the naves. These arrangements may be varied, rods or levers, or other equivalent mechanism, being in some cases substituted for the bolts and springs.

The invention includes a mode of constructing a "double axle-tree box," this being composed of two cylinders or tubes, one being smaller than and being inserted within the other, the space between them serving as a reservoir for oil. The inner cylinder, through which the arm of the axletree passes is perforated at equal distances by holes through which a constant supply of oil passes to the axle arm. The smaller cylinder is screwed into the other for a portion of its length, and each end of the box is provided with a cap, the escape of oil from the box being thus effectually prevented, a screw plug being provided on the removal of which a supply of oil may be introduced into the box. Various nuts, collets, washers, and other instruments for securing the box within the nave of the wheel are described, but these are all of the ordinary character, and form no part of the invention.

[*Printed, 7d. Drawing.*]

A.D. 1835, March 4.—No. 6781.

BERGIN, THOMAS FLEMING.—Connecting and buffing carriages. This invention though described in connection with railway carriages is claimed as applicable also to trains of vehicles in common roads.

The invention "relates to improvements on the apparatus called the buffing apparatus" and its object is to apply "arrangements or combinations of coiled springs with rods proceeding from end to end of the carriage, which shall at once offer a most advantageous apparatus for receiving and transmitting the motion from one carriage to another, and also prevent any prejudicial effects of concussion in starting or stopping a train of carriages, and also be highly suitable for preventing any prejudicial effects taking place in the event of two trains coming into contact." The rods rest

upon rollers which allow them to move freely backwards or forwards, one rod, however, only being used to each carriage, and "about four feet of coiled or spiral springs" of "graduated "strengths" being placed on the rod just within each end of the carriage framing, one end of each of the sets of springs resting against a collar or boss on the rod and the other end against a small box of iron attached to the carriage frame. The rod extends about two feet beyond each end of the carriage, and has at each end "a buffer head," the patentee stating that he has used a welded iron tube in place of a solid rod, and mentioning various advantages as arising from the arrangements described. The frame of the carriage is strengthened by diagonal tension rods.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1835, March 11.—No. 6785.

BACON, JOSHUA BUTTERS.—Steam carriage. This carriage which is described as intended to run on a railway, but which is claimed as equally applicable to common roads, is driven by means of steam issuing from the ends of rotating arms contained within a cylinder or jacket. The axis of these arms carries a pinion which gears into another on the axis of a series of consecutive discs or pulleys. Against one of the latter there is pressed another pulley having on its axis a smaller which is caused to bear on the upper part of the periphery of the driving wheel for the purpose of causing it to rotate. The adhesion of these pulleys is effected by levers which form also part of the suspensory system of the vehicle.

An arrangement of levers is also provided for the purpose of adjusting the weights carried by the wheels, and the leading and trailing wheels are so connected by levers that the driver may, on turning a curve, cause the trailing wheels to adapt themselves to the course.

[*Printed, 6d. Drawing.*]

A.D. 1835, March 13.—No. 6790.

ADAMS, WILLIAM BRIDGES.—Wheels. The improvement in wheels consists, firstly, in strengthening the periphery by inserting a hoop of iron within the usual circle of wooden felloes, and secondly, in substituting for the spokes usually employed,



circles or hoops of steel secured to the above-mentioned rim and a central axle box. These spring hoops may be strengthened by multiplying the plates. They are also capable of being made in various patterns. The wheels may also be divided or flat. The central axle box is fitted with an annular oil chamber which surrounds the axle. The box is perforated with holes for the passage of the oil, which by the rotation of the oil chamber is constantly being raised and poured through them.

By the use of these wheels carriages may be suspended by a simpler system of springs; and in order to enable four large wheels of equal size to be applied to a carriage, the patentee shows a system of bringing the fore carriage to the main body to which system however he lays no claim.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1835, March 16.—No. 6791.

CHURCH, WILLIAM.—“Improvements in apparatus to be  
“ employed in the conveyance of goods and passengers by land  
“ or water, parts of which said improvements are also appli-  
“ cable to the ordinary purposes of steam engines and other  
“ steam apparatus.”

One part of this invention relates to the boilers of locomotive carriages meant for use on common roads. An arrangement is described in which various water chambers surround certain furnace flues and a fuel or coking chamber, a steam chamber furnished with safety valves and a steam gauge being also provided. The fire bars are composed of tubes filled with water, and the fuel is supplied to the furnace through a hopper which is provided with double shutters, and opening into the coking oven or chamber, all these parts, with their adjuncts, being fully set forth, and at considerable length, motion being communicated from the working parts of the engine to the axle of the hind wheels of the vehicle, the wheels themselves being fixed upon the ends of tubes which are locked to the crank shaft by clutches, the axle itself turning between antifriction rollers mounted in slings or boxes to which the springs of the carriages are attached. The fore wheels are mounted upon separate short axles, connected with suitable steering apparatus by which the vehicle may be guided in any requisite direction, and a friction band or drag

is placed around a brake wheel, and so arranged that the conductor, by pressing upon a lever with his foot may tighten such band and so retard the motion of the vehicle at pleasure. According to one of the figures in the drawings annexed to the Specification the vehicle is provided with a body for the accommodation of both inside and outside passengers much resembling that of an ordinary stage coach. The details of all the parts of the vehicle are very fully set forth, and illustrated by a number of elaborate drawings. The other portions of the invention do not require notice here.

[*Printed, 8s. Drawings.*]

A.D. 1835, April 4.—No. 6807.

HARDY, JAMES.—Axles. The first part of this invention relates to the manufacture of shafts by arranging around a cylindrical core a number of radial bars or segments previously rolled to true pattern, and then subjecting the whole to a welding temperature and completing by rolling or swaging.

It also relates to the manufacture of axles. These are cut with a chisel and pieces of steel are inserted in the cuts. The axle is then heated in an air furnace and swaged in dies. By this means that part of the axle which bears the friction of the wheel is protected. Collars are fashioned on axles by means of dies.

[*Printed 7d. Drawing.*]

A.D. 1835, April 14.—No. 6812.

INGLEDEW, JOHN.—Safety wheel and axle. This invention relates to the construction of a metallic wheel, the spokes of which are inserted in mortices in the nave and periphery, or continuous felloe, and secured therein by wedges or keys. Inside the hollow of the nave is inserted a circular wedge or hollow cone or sleeve, which keeps all the fastenings in place. By this arrangement the spokes are secured against the effects of shunting strains.

The axle runs in an elongated box attached to the carriage framing. A screwed centre pin keeps it in proper position in the box. The wheel is secured to the arm projecting from the

box by means of a screw nut. The details of the invention cannot be clearly rendered without the assistance of the drawings.

[*Printed, 10d. Drawing.*]

A.D. 1835, May 9.—No. 6828.

SIMPSON, WILLIAM.—“A safety drag or lever slide for “carriages.”

In this invention a large bent lever is employed, which is mounted upon a fulcrum below the hind axle of a carriage, one arm then projecting diagonally backwards and downwards, and the other arm, which is longer than the first, projecting forward under the body of the carriage. The end of the arm first mentioned carries a shoe or drag, and with the end of the longer arm a chain, strap, or rope is connected, which is thence carried onwards to a barrel furnished with a winch, and which is mounted in such a position that the winch may be turned by the driver of the vehicle, the result of turning the winch being that the rope, strap, or chain being coiled upon the barrel draws up the end of the longer arm of the lever, and so causes the shorter arm to descend and press the shoe upon the ground. On the axis of the barrel is a ratchet wheel, and a catch or spring is so arranged as to act upon the teeth of this wheel, and prevent any return motion of the barrel until it is desired that the drag shall no longer operate, when the catch or spring is released by means of a pedal and other apparatus, and the movement of the barrel is reversed and the lever moved back into its first position by means of a spring, again raising the shoe from the ground. In order to increase the power of the apparatus a chain or rope may pass from the barrel to a large pulley, upon the axis of which is a smaller pulley, a second chain or rope proceeding from the latter to the lever, and the shoe may be studded for use in frosty weather.

[*Printed, 6d. Drawing.*]

A.D. 1835, May 27.—No. 6840.

BERGIN, THOMAS FLEMING.—“Certain improvements in the “method of suspending and adjusting the bodies of railway “and all other wheeled carriages.”

In this invention instead of the body of the carriage being mounted upon springs arranged in the ordinary manner, it is suspended from "crane-neck standards" which project upwards from the framing of the carriage and sustain links composed of rods jointed together and capable of adjustment in length by means of screws, and having combined with them a number of chains, springs, pulleys, and other adjustable rods and apparatus by which the body of the carriage is supported. The details of the invention which are somewhat complex, will only be understood with the aid of the drawing annexed to the specification, these details, moreover, being capable of variation. The object of the invention is to suspend carriages requiring the use of springs, "that whatever may be the number of springs upon or from which any individual carriage may be suspended or hung, the elasticity of all the said springs shall be brought into play by any load," upon whatever part of the carriage such load may be placed, "or by any concussion of the wheels against stones or other inequalities of the road over which the said carriage may run; or in other words in such a manner so as that all the said springs shall be affected alike, or nearly so, that is, compressed or extended alike, as the case may be, by the imposition of a load upon the said carriage, or whenever a concussion or jolt takes place by any one of the wheels coming in contact with a stone or other abrupt obstacle."

[*Printed, 1s. 1d. Drawing.*]

A.D. 1835, August 14,—No. 6880.

DAY, JOHN. — Wheels. This invention consists in making wheels entirely of wrought iron. Each spoke is made with a portion of the periphery welded thereto at one end and a segment of the nave at the other. These are then all welded together, a plate being welded at each side of the nave. In some cases a thicker plate may be required on one side than on the other. A bar of iron may further be welded round the outside of the periphery, or a tire may be shrunk on. The joints are scarfed. The nave is then bored out and the axle secured therein, or instead, an axle box may be fitted for a loose axle. To secure the axle to the wheel keys are driven in longitudinally to the axis. The axle also projects beyond

the wheel and has a groove cut round it. Two semicircular plates or collars fit into this groove and are attached by screws to the nave. They also hold in the keys. By this means the wheel is secured against accidental loosening.

[*Printed, 10d. Drawing.*]

A.D. 1835, September 24.—No. 6895.

MASON, WILLIAM.—Wheels and axles. This is a compound wheel. The felloes are built up of wrought iron parts jointed together and forming a channel to be filled in with wood. The nave is of cast iron with wood interior. The spokes have shoulders at each end. The whole is held together by a shrunk tire.

Axle boxes are made of iron plates cut with grooves for lubricating fluid, bent and welded up and bored out truly. The requisite screw is cut on the outer end of the box.

When axles have to be secured to the wheels, a collar is put on which turns with the axle, but being loose, adjusts itself when it becomes warm. The axle is keyed to the nave and further secured by a screw nut. A plate is fitted on the outside of the nave and a screw passed through it into the axle. The axle box, a long tube, is attached in the ordinary way to the vehicle. Washers are provided to make all tight.

[*Printed, 10d. Drawing.*]

A.D. 1835, December 16.—No. 6955.

CARPMAEL, WILLIAM.—(*A communication.*)—Steam carriage. This carriage has the form of a French diligence, or three bodied stage carriage. The boiler is contained in the hinder compartment and the machinery is underneath the carriage body. The driving wheels are worked by a cranked axle. For the purpose of relieving the latter from strain the naves of the wheels have boxes or sockets which fit the ends of the axle and which also bear the weight of the vehicle through the springs. They are also connected with the axle by clutches. In order to allow for the movement of the springs, the cylinders and driving machinery are secured in a frame suspended or pivotted under the carriage framing. The steam pipe is also passed to the cylinders near the point of support.

The carriage is guided by a steam cylinder which acts on the swivelling axle by chains. The cylinder is also fitted as a "dasher" or "cataract" apparatus so that by closing a cock to prevent further passage of the oil or other fluid the wheels are held in the required position. A dasher cylinder is also fitted to the framing for the purpose of acting as a brake. The nave socket is fitted with an excentric, working a piston in this cylinder. By regulating the valve the wheel may be braked and by stopping the valve it may be caused to cease turning altogether.

[*Printed, 11d. Drawings.*]

A.D. 1835, December 31. No. 6972.

BLYTH, JOHN.—"An improved method of retarding the progress of carriages in certain cases."

This invention consists essentially "in attaching a friction band, acting round a friction pulley placed on the nave of the wheel, to the body of a frame of the carriage, and hanging the body in such manner on the springs that when any sudden check is given to the train, or when the carriage is descending a hill, the body will slide forward and draw the friction band tight around the friction pulley, thus assisting the horses to pull up when required on level ground, and to hold back when going down hill," without any attention being required from the driver to put the machinery by which this is effected into action.

An arrangement is set forth in which a "saddle piece" is bolted to one of the hind springs of a vehicle having four wheels, this saddle piece sustaining one end of a curved piece of metal, to which a second similar piece is jointed, others following in succession, and the whole forming a friction band, which is secured by means of an arm or bracket to one of the side frames of the vehicle. In the ends of the ordinary bearing springs loops or slots are formed, the frame or body of the carriage, however, resting directly upon cross or transverse springs, the ends of these being provided with antifriction rollers, which work in the loops or slots of the ordinary springs, and are capable of moving to and fro therein. Thus when the vehicle is descending a hill, or when the driver suddenly pulls up the horses, the body of the vehicle will

move forward and the friction band become tightened around a pulley which is fixed upon the nave of one of the hind wheels.

[*Printed, 5d. Drawing.*]

A.D. 1836, January 19.—No. 6984.

HARSLEBEN, CHARLES.—Propelling carriages and improvements in wheels. The first part of this invention relates to a method of propelling vehicles by means of the walking movements of a horse upon an endless flexible platform which passes round rollers, and is by them caused to work the wheels. This platform is capable of angular adjustment so that the horse may be caused to exert more or less force as occasion may require; moreover, if the platform be inclined the horse's weight is added to his work.

Another part of the invention relates to the construction of a wheel "the periphery of which admits of change of form " by pressure," the result being that the wheel offers a more extended surface to the ground on which it works than would be the case if the periphery were rigid. Such a wheel is not meant, however, to be employed as the bearing wheel of a carriage, "but as a supernumerary wheel."

The spokes of the wheel are each composed of a hollow portion united to the nave and a second and outer portion capable of sliding to and fro to some extent within the first, a spiral spring being inserted between the nave and the inner end of the moveable portion of the spoke. To the outer end of the latter is attached a segment of the periphery of the wheel, the segment being also connected with the hollow part of the spoke by "stretchers," certain studs or cross arms being so arranged as to prevent the segments "from being turned out of the " plane of the wheel." The segment of the periphery attached to each moveable portion of spoke is flexible, and thus, as the wheel revolves that portion of the periphery which is in contact with the ground is flattened by the weight or pressure of the load being carried, such flattening bringing a larger portion of the periphery of the wheel into contact with the ground than would otherwise be the case. Such a wheel therefore "assists in the propulsion of the carriage by taking " hold of the ground, in addition to the hold of the tire of the " bearing wheel on the rail "

Another part of the invention consists in the application of a semi-cylindrical screen to the "leading end" of a carriage in order to "lessen retardation from atmospheric resistance" when such carriage is moving with great velocity. This screen may be composed of "very light materials" such as canvass or leather, or both "supported by strips of whalebone, " pressed outwards by spiral springs that will yield in case of " any accidental pressure from without."

[*Printed, 1s. 6d. Drawings.*]

A.D. 1836, January 30.—No. 6992.

BOULNOIS, WILLIAM, the younger.—"An improved combination or arrangement of springs for carriages."

According to this invention two springs of the ordinary form are combined together in the ordinary manner, one being inverted over the other, and the two being connected at the ends. Within these are two other springs, of similar form, but of smaller size, and the inner and the outer springs are united by means of blocks, the four springs being thus combined together and working in unison. The blocks extend both above and below the central parts of the springs, and on the axle of the carriage is a block or bracket which partially embraces the projecting part of the block which extends below the springs, while a similar block or bracket, connected with the proper part of the carriage partially receives the block which projects above the springs, the blocks of the springs being connected with the blocks or brackets on the axle and carriage by means of pins which form pivots or axes, the result of the whole arrangement being that the blocks are capable of a slight rocking motion, "and thus permit of lateral movement " to the springs," in addition to the ordinary "elastic play " up and down." This lateral action may be obtained by other means, as, for instance, by furnishing the end of one spring with a small pivot or axis which works in a strap or collar on the end of the corresponding spring. The patentee terms the inner springs "loading springs," but these, if desired, may be dispensed with, and the details of the invention be otherwise modified.

[*Printed, 5d. Drawing.*]



A.D. 1836, April 23.—No. 7070.

MASSEY, EDWARD JOHN.—“Improvements in railway and  
“ other locomotive carriages.”

According to this invention, two quadrangular frames constitute the main framing of the carriage there being one pair of wheels to each frame. “These two frames are coupled  
“ together one behind the other by a bolt, there being a  
“ washer between the frames to keep them apart, the bolt  
“ having a head at one end and a split cotter through the  
“ other,” or they may be connected “by screws and nuts by  
“ which means the two frames, though securely held together,  
“ are capable of movement in case of any inequality of the  
“ level of the railway or other road on which the locomotive  
“ carriage runs.” “If the locomotive carriage have three  
“ pair of wheels, then there are to be three frames, connected  
“ to each other in like manner.”

[*Printed, 5d. Drawing.*]

A.D. 1836, May 13.—No. 7093.

ASHDOWNE, JOHN.—Facilitating draught of vehicles. For this purpose a chain made up of a series of short iron bars is made to travel round with the wheel, and is laid on the ground in front of the wheel by means of a guide bar projecting from the axle. The chain forms a road or railway upon which the wheel runs more easily than on the ground.

[*Printed, 6d. Drawing.*]

A.D. 1836, June 7.—No. 7108.

BOWER, MANOAH.—“Improvements applicable to various  
“ descriptions of carriages.”

This invention relates to that part of a carriage which is called the folding head or cover. The patentee states that  
“ according to the ordinary construction of heads the same,  
“ when folded down, are considerably in the way, and are  
“ more or less heavy and unsightly,” but that according to this invention such heads or covers “may be made to fold  
“ down so completely out of the way that the whole may be  
“ out of sight,” and that “such is the lightness yet strength  
“ and elegance of the combination of the parts” that they may be raised or lowered with great facility.

An arrangement is described in which certain hollow standards are affixed to the framing of a carriage, these receiving sliding standards, the latter being connected with a certain plate, and there being certain wire stretchers and frames or boxes combined therewith. This arrangement may, however, be varied, the details of the invention being dependent upon the particular form of vehicle to which the invention is applied.

[*Printed, 9d. Drawing.*]

A.D. 1836, July 13.—No. 7147.

HORLIAC, LOUIS MATTHIAS.—(*A communication.*)—"Certain improvements in carriages and harness."

[*No Specification enrolled.*]

A.D. 1836, August 6.—No. 7162.

REINAGLE, RAMSEY RICHARD.—Carriages, wheels, pole and springs. This invention consists, firstly, in "the suspension of the body of a carriage upon springs attached to the upper part or roofing," the frame of the carriage being connected with short axles on which the springs will rest, "whether placed under the roof's projection or on it, or against the side of the body, or within the body, or if hooked to the body, from a connecting bar, from arm to arm, or upon traversing bars across the top of the framing, in the inside or outside, and by any means of elastic india-rubber rope or chains," this part of the invention also including "the employment of two large wheels at the centre of the body" and "separating the body from the usual connection with the first wheels and framing on which the driver and outside passengers may sit," thus giving to the body of an omnibus or other four-wheeled carriage "the easy draught and simplicity of a two-wheeled one." The body is united to the "front action" by means of "two pair of draught shaft arms" composed of rods of iron united by open or angle work, these arms passing from the axle of the large wheels to the front frame.

Secondly, the invention relates to the construction of "elastic anti-concussion wheels of larger dimensions than ordinary." One wheel is described in which the spokes are composed of bars or strips bent into an elliptical or nearly

elliptical form, the ends of these bars being secured in openings in the nave by wedges. Another wheel is described in which the bars or strips composing the spokes are bent into a more oblong figure than in the wheel mentioned above, this wheel being less elastic than the first. And a third wheel is described in which the spokes are composed of bars bent "over a form the shape of an egg," a leg projecting from one part of the bar thus bent being connected with the nave of the wheel and the opposite part of such bar being united with the felloe, this wheel being "inflexible or incompressible." The spokes of all these wheels are connected with "trice-formed iron tires or hoops," and the spokes of the first-named wheel are sustained near the nave by T-formed rests while in all the three large flanges are used which extend beyond the nave and aid in supporting the spokes. This part of the invention includes the casing of the wooden felloes of ordinary wheels with plates of iron.

Another part of the invention consists in "shaping the tenons of wooden spokes wedge-formed," and inserting them into correspondingly formed mortices in the nave. "The angular cuttings of the mortices will prevent splitting."

Another part of the invention consists in a mode of facilitating the turning of a carriage "by employing triple arms carrying friction rollers within a circular box or case, capped over to keep out dirt," this circular box or case being apparently meant to form the front frame of the carriage mentioned with reference to the first part of the invention.

Another part of the invention consists in forming a carriage pole of blades of steel, "bowed elliptically to afford a spring power" and having for a leader or leaders a piston rod acting upon a powerful spring within a tubular head, the object of this spring being "to keep each horse to his equal share of work," while the spring action of the parts forming the pole "will save much strain upon the carriage in sudden starting."

The invention includes a mode of constructing the bodies of carriages "by panelling of sheet metal (iron principally) over an iron framing."

[Printed, 1s. 4d. Drawings.]

A.D. 1836, August 11.—No. 7170.

HURLOCK, REVEREND ROBERT ALLEN.—“Improvements in  
“ axletrees.”

In this invention the axletree is divided into two parts, and the end of each part which passes into the wheel is of square section, and is secured in the wheel by screws and nuts or other suitable means. On the inner end of each part or single axle is also a projecting collar, these collars turning in grooves formed in a central axle box, and similar collars on the two parts working in grooves in the outer axle boxes, the two parts being thus retained in due position. The three boxes have each fixed on the upper surface a light iron bar, curved upwards on each side in the form of a spring, and the ends of these curved bars are united by cross bars, the whole forming a kind of frame on which the body of the vehicle is supported. By these arrangements each wheel revolves with its own part of the axle, independent of the other or others.

[*Printed, 6d. Drawing.*]

A.D. 1836, September 21.—No. 7188.

POOLE, MOSES.—(*A communication.*)—“Improvements in the  
“ description of public vehicles called cabs.”

For this invention the body of the vehicle may be varied in form, but in all cases the entrance is from behind, either a single door or folding doors being used, as may be preferred. The axle is cranked, for the purpose of bringing the body near to the ground, and such body is described as being mounted upon “elliptical springs” made according to an invention for which a patent was granted to William Boulnois, the younger, on the 30th of January 1836, but other springs may be employed. The shafts are connected with the body of the vehicle by pin joints, and each shaft passes through a socket which is sustained by a bracket projecting from the front of the vehicle, the shafts being capable of moving up and down to some extent in the sockets, and being moreover provided with springs so arranged that “the weight on the  
“ horse is relieved.” Steps are placed in front of the vehicle in order to give access to the driver’s seat, which is on the top of the vehicle, and other steps are placed behind the vehicle for the convenience of passengers. Windows are

placed in front of the vehicle, and also at the back, and ventilators, composed of flat narrow boards, mounted on axes, and capable of being variously adjusted, are also provided. In one arrangement of the vehicle the passengers occupy seats placed along each side, thus facing each other, this vehicle being meant for the accommodation of two passengers only, but another arrangement of vehicle is described in which more than two passengers may travel, one passenger sitting on each side of the doorway, and a third occupying a folding seat which may be placed across the doorway when the door is shut. In this arrangement the passengers sit with their faces towards the horse. The front part of this vehicle may be more or less open, and may be furnished with windows, folding blinds, and other conveniences, according to the taste of the builder. The construction of the framing of the vehicle is very clearly set forth in the drawings annexed to the Specification, and will only be understood with the aid of such drawings. The interior may be lined in any suitable manner.

[*Printed, 2s. 1d. Drawings.*]

A.D. 1836, September 28.—No. 7197.

PEARSON, RICHARD.—“Certain improvements in drags or “apparatus for retarding carriages.”

According to this invention pulleys are affixed to the hind wheels of the carriage to which it is desired to apply the invention, there being placed around these pulleys friction bands, which are composed by preference of steel springs lined with leather. A bar or axis is mounted so as to cross the framing of the carriage from side to side, and in connection with this are certain rods and arms, and a long lever which may be operated upon by the driver of the vehicle, a foot lever and foot board also being connected with the apparatus. The long lever may be retained in any desired position by means of a click or catch, and a rack arranged to receive it, the click or catch being raised from the rack by a handle when requisite.

The invention is illustrated by a drawing which it will be necessary to inspect in order to understand the details of the apparatus employed. The invention may be applied to the

fore as well as the hind wheels of the vehicle, and either separately or in combination.

[*Printed, 6d. Drawing.*]

A.D. 1836, October 20.—No. 7212.

ADAMS, WILLIAM BRIDGES. — Carriages. This invention relates, firstly, to an improvement in omnibuses, and consists in making the body of an omnibus “in two parts or half “bodies, whereof each one is mounted with suitable springs “in its own axletree and pair of wheels,” which may be all of large diameter, the two half bodies being connected together “by joint work at the floor and at the ceiling,” which permits of the vehicle readily adapting itself to turns or curves in the road, the two parts being, moreover, so connected as to allow a free passage from end to end of the whole vehicle, the floor of the one part being so extended as to project over a corresponding projection from the floor of the other, and the sides of the two portions of the vehicle being connected together by flexible material. The joints each have “a prominence on the upper half or portion thereof “accurately fitted into a corresponding hollow cavity in the “lower half or portion of the same joint.”

Another part of the invention relates to the construction of a spring suitable for wheeled carriages, which consists of “a “bended bow, of any eligible elastic material, the two ends of “which are connected by an elastic or non-elastic cord, strap, “band, or chain of metal links, the middle part of the bow “being affixed to that part of the carriage which is provided “for supporting the spring, and the weight of the body of the “carriage being supported by the middle of the cord of the “bow.” Or the middle part of the cord may be suspended on the support, and the middle part of the spring affixed to the body. The tension of the spring may be regulated by tightening or slackening the cord by means of screws or otherwise.

Further, the invention relates to the construction of cranked or bended axletrees, and consists in forming such an axletree “of two broad but comparatively thin bars, disposed edgway “upwards with a space between them,” such space being filled with wood or partially occupied by blocks of wood or

tubes of iron, the whole being secured together by bolts. Cranked or bended axles are also described as being formed in parts, joined together by overlapping at the bends, and by bolts.

Another part of the invention relates to the construction of a two-wheeled cabriolet, to be drawn by one horse and driven by a person behind the body, the reins passing over the roof, and the driver either standing on a board or being seated, or reclining against a strap or bar behind the entrance door, which is at the back of the body, the front having a window, which, together with part of the roof, can be opened or closed at pleasure.

The invention also relates to the construction of four-wheeled waggons, each having "a compound jointed body" made in two parts, the floor of one part lapping over the floor of the other part, and the overlapping parts being "united by a central turning bolt," the axles being bent downwards so as to cause the body and its load to travel near the ground, the loading and unloading being effected by means of an opening in one side or other of the waggon, near the middle of its length. The four wheels are "full sized," and the waggon is adapted to travel either end foremost.

[*Printed, 2s. Drawings.*]

A.D. 1836, November 8.—No. 7218.

WHITCHER, JOHN.—"Improvements in drags or apparatus applicable to carriages."

In this invention, which is described more particularly as being applied to a waggon, a beam or bar is in the first place fixed across the hinder axletree, there being jointed to this beam one end of a rod, the other end of which descends and is jointed to a skid, a second bar, also jointed to the skid at the same place, passing upwards to the perch of the waggon, and being also jointed thereto, these bars serving to sustain the skid and guide its movements in being raised and lowered. Jointed to the skid is also one end of a third bar, this extending diagonally upwards, and having at its other end a pulley or antifricition roller which is placed between two curved guides which are supported by the cross bar or beam on the

axle, this pulley or roller, as the skid is raised or lowered, working between the guides, a short chain connecting the upper end of the bar which carries the pulley to the cross beam, and preventing it from moving too far. To the upper end of this bar is also connected a chain which passes over guide pulleys and onwards towards the shafts of the waggon, near to which it is united with two other chains, these passing along the shafts and being attached to sliding plates to which the tug chains from the horse's collar are hooked, the result being that when the horse is drawing the vehicle forward the skid is raised from the ground, but descends thereto on the horse ceasing to act upon the tug chains. Other chains, connected with the first, are so arranged that when the horse bears against the breeching in descending a hill the skid is likewise lowered. A drag chain is attached to the front of the skid, which passes over a pulley suspended from the body of the waggon and is then attached to one end of a hoop or open bar, the other end of the latter being attached to one end of a second chain which passes around a second pulley and is hooked to the bar which carries the antifriction pulley, a short chain from the centre of the latter being connected with the framing of the vehicle.

[*Printed, 9d. Drawing.*]

A.D. 1836, December 19.—No. 7259.

ROUTLEDGE, THOMAS, and GALLOWAY, ELIJAH. —  
“ Certain improvements in cabriolets and omnibuses.”

According to the first part of this invention a cabriolet is so constructed that the body is much lower than usual, the axle, which is straight, passing through the body of the vehicle at a short distance below the seat. The springs are such as are ordinarily used, and connected with the front part of the vehicle are two rollers or small wheels, which do not touch the ground under ordinary circumstances, but are so arranged that if the horse should fall they will descend, “ and probably prevent the cabriolet from being overturned.” If preferred, one roller or wheel may be used instead of two. Another part of the invention relates to an improved sliding head or hood, which is of corresponding curvature with the front of the vehicle, and is so contrived that it can be shut



down and secured by any usual mode of fastening. The shafts, dashing irons, and other parts, are arranged in the ordinary manner, and the wheels are set forth as being made in accordance with the invention for which a Patent was granted to Joseph Gibbs on the 4th of November, 1834, such Patent having been assigned by the said Joseph Gibbs to Thomas Routledge, one of the parties to the present Patent. The patentees, however, do not confine themselves to any particular form of wheel.

A cabriolet is also described in which the wheels revolve upon arms which are either welded or otherwise connected with upright bars, these being joined at both their upper and lower ends to springs by which the body of the vehicle is sustained. Another part of the invention relates to the construction of an omnibus, the body of which, instead of having straight and parallel seats, with an entrance at the back, is divided about midway into two equal parts, the passengers entering through doors in the sides, and occupying seats which are arranged so as to form portions of circles. The wheels are all of equal size, "and in turning " the carriage they all lock," the vehicle thus differing from other carriages, the fore wheels only of which can lock.

Another part of the invention relates to an indicator for ascertaining the distance travelled by a cabriolet or omnibus. To the nave of one of the wheels is affixed an excentric ; this, as the wheel rotates, gives a reciprocating motion to a lever carrying a pawl, the latter moving a ratchet wheel one tooth at each revolution of the wheel, and thereby communicating motion to a train of wheelwork of ordinary character and a hand or pointer. The diameter of the wheel being known, this apparatus may be made to show, upon a graduated index, the distance moved over by the carriage.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1836, December 21.--No. 7266.

GILLETT, STEDMAN, and CHAPMAN, JOHN.—"Certain improvements in that description of vehicles called cabs."

This invention consists, in the first place, in "the application of a driving seat or box (or such like convenient support

“ for the driver) to the back of such description of two-wheeled one-horse vehicles as are so constructed that the passengers enter in front, and suitable for cabs.”

Secondly in a mode of “ applying and working of a window or blind to cabs from the outside.” Two glazed frames or windows are hinged together, and are capable of folding up, the upper frame being mounted on axes at each side of the vehicle, and a handle being so arranged that the driver can at any time give motion to the frames so as to open or close the window, projections from the lower frame working along curved inclined planes during such opening or closing, and a spring catch being arranged to hold the parts in position when closed, which catch, however, may be liberated by the passenger should he desire to operate upon the window himself.

Thirdly, in applying “ a safety frame and platform (by which the passengers enter in front) on springs when the driver’s seat is placed either at the back or on the top and in front,” the patentees stating, however, that they do not claim the application of such frame and platform for the passengers “ when not placed together with the body of the vehicle on springs,” nor when the vehicle is “ driven from a seat at the side.”

Fourthly, in a mode of applying the side and back springs of cabs, “ whereby the passenger’s seat is below the position of the springs,” the axle of the cab, which is cranked, being “ so formed that the springs may be horizontal, and the cranked axle stand off at an angle.”

Another part of the invention relates to apparatus applicable to cabs, for measuring the distances passed over. On the nave of one of the wheels is fixed an eccentric, near which is a bar bent at each end, and constantly worked to and fro by the eccentric, this bar carrying a curved plate which gives a to and fro motion to a lever, which, through the medium of certain other apparatus, moves a ratchet wheel one tooth at each revolution of the cab wheel, there being on the axis of the ratchet wheel a pinion which turns a wheel, on the axis of which again is a screw or worm which drives another wheel, the axis of which carries the hand of a dial or face,” which “ is graduated to measure forty-five miles.” The whole of this apparatus is placed under the passengers’ seat, and en-

closed so that it cannot be interfered with by the driver, but other apparatus of a similar character may be added to this so as to work the hands of two other dials, one of which may be within view of the passenger, and the other towards the driver, the latter being able to set these hands at zero on starting with a passenger, a stop being so arranged as "to prevent the driver forcing the dials back beyond zero."

[*Printed, 1s. 4d. Drawings.*]

A.D. 1837, January 11.—No. 7279.

BRABY, JAMES.—"Certain improvements in the construction of carriages."

This invention relates, in the first place, to a horizontal cranked axle or axletree which may be applied to various descriptions of wheel carriages. In one arrangement which is set forth, the axle is "curved to the segment of a circle." In another arrangement the axle is formed of one piece "bent at a right angle." Other arrangements are described, in one of which a horizontal cranked axletree is formed in two pieces, while in another case a horizontal cranked axletree is combined with the common vertical cranked axle tree. The patentee states that the advantages resulting from the use of this horizontal cranked axletree are the facility with which perfect safety may be obtained by bringing the centre of gravity of the carriage and loading to the lowest point, the invention not being confined to the perfectly horizontal position of the axletrees when attached to the carriage, "but only so far as they shall not deviate more than the angle of forty-five degrees from the horizontal position."

Another part of the invention relates to the springs of carriages. An arrangement is described in which two curved springs are employed, which are attached to the lower part of a cranked axletree and also to scroll irons connected with the framing of the carriage, the intention of the arrangement being that the spring may "vibrate equally with a light as with a heavy weight." A modification of this part of the invention is also described, in which "double curved springs" are used.

Another part of the invention relates to the construction of carriages, either for public or private purposes, the entrance

for the passengers being by a door or doors or openings in front, and such carriages being provided with either two or three wheels, and so arranged as to be drawn by one horse; while another part of the invention consists of improvements in the construction of public stage carriages or omnibuses for either one horse or more, and with four wheels, the entrance or entrances for passengers being either in front or before the fore axletree. All these improvements are very fully set forth, and their advantages described, one of the latter consisting in dispensing with the services of a conductor.

[*Printed, 2s. Drawings.*]

A.D. 1837, January 19.—No. 7285.

MURRAY, JOHN.—“Certain improvements in the construction of carriages.”

[*No Specification enrolled.*]

A.D. 1837, February 23.—No. 7309.

WESTON, JASPER.—“Improvements in certain wheeled carriages.”

This invention is set forth at some length, and consists essentially in:—

Firstly, “the application of a pole or shaft in such manner that it is over or above the back of the horse or other animal harnessed thereto, in place of having the shafts or pole at a position below the back of the animal,” as usually practised.

Secondly, a mode of harnessing horses or other animals to carriages by means of what the patentee calls “riders,” applied to suitable poles.

Thirdly, in applying a driving seat to an under framing of a two-wheeled carriage, suspended from the axletree by springs, such seat being independent of the body of the carriage.

Fourthly, in a mode of applying a driving seat to the body of a two-wheeled carriage at or above the head, so that the head may fold up notwithstanding the position of such driving seat.

Other parts of the invention relate to certain arrangements of springs for carriages, according to one of which under

framings are suspended from the axletrees by springs, and hanging the body of the carriage on further springs in connection with the first. Also certain modes of arranging side doors to two-wheeled carriages, and a mode of applying Dennet springs to the fore carriages of four-wheeled vehicles. Several modes of constructing elastic wheels are also set forth; the application of metal or metal-bound naves to wheels with elastic curved spokes; elastic hoops fixed concentrically with the external ring of the wheel by means of tubes having rods passing through them, or otherwise, forming one part of this portion of the invention, while in another case an external ring or felloe is supported by internal springs, some of which form angles at their points of junction with the felloe, and are connected with and supported by other springs attached to the nave of the wheel. The details of these arrangements, however, will not be understood without the aid of the drawings annexed to the specification.

[*Printed, 1s. Drawings.*]

A.D. 1837, May 6.—No. 7364.

HAYMAN, GEORGE.—“Improvements in two-wheel carriages.”

This invention “consists principally in the attaching a double-action elastic steel spring to the back part of each shaft immediately behind the treads, which springs (the shafts being fixed in pivots) are so constructed as to act equally well, whether the horse be ascending or descending a hill, coming into effective play by a pressure from above or below. From the peculiar properties of this spring the body can be so suspended on the shafts and wheels as to almost entirely relieve the horse from the weight usually thrown on his shoulders. He will thus be less liable to fall, and the safety of persons in the vehicle will be to a great degree insured.”

“The front cross bar of wood to which the draft bar or springs are generally attached is in this carriage dispensed with, and a slight bar of iron placed immediately underneath and close to the bottom of the body, so that the chance of a horse’s striking his hind legs in fast trotting or galloping (which according to the old construction was a

“ fruitful source of accidents) is here entirely got rid of. A principle well known, but new as applied to the draught of carriages, is adopted. A spiral spring capable of resisting the pressure of from one to sixty pounds is attached to the side of each shaft so as to move freely, over which is an index plate and pointer as in the spring balance. From a hook attached to each spiral spring the horse draws,” and the pointer “will at all times show what the resistance to the carriage is, and should this at any time be much increased, the owner will have information that the carriage is out of order, and be enabled to have it rectified before his horse has suffered from the increased draught. The gentle and pleasant action of the spring will tend to prevent the chafing of a horse’s shoulder.”

The invention embraces the employment of an axle box of wrought iron, which is furnished with an external screw thread at the inner end for the reception of a screwed clip or collar, which, in combination with a fixed collar on the axle, keeps the wheel in its place on such axle, a cap being, moreover, screwed to the outer end of the box.

[*Printed, 8d. Drawing.*]

A.D. 1837, May 10.—No. 7369.

HAGUE, JOHN.—Wheels. This invention relates to “wheels which are employed on railways.”

The first part of the invention consists in forming each spoke of a wheel of two flat bars which are united at the outer ends, the inner ends, which are to be united to the nave, being some distance apart, but so bent towards each other that a short portion of each bar lies parallel with a corresponding portion of the next, and is bolted thereto, a nave of cast iron being then run upon and enclosing these short portions. The ring or felloe of the wheel may be composed of wrought iron, the outer ends of the spokes being inserted into mortices or holes formed therein; or a ring of cast iron may be run upon such ends, the latter in either case being “forged into a tenon.” In the case of a cast iron ring being used, however, it should be cast before the nave, and allowed to cool before the casting of such nave, in order to avoid the evils of unequal contraction. Instead of each spoke being

composed of two bars it may consist of one bar suitably bent ; or four bars may be united at the outer ends, the inner ends standing somewhat apart, and being enclosed in the nave as already described.

Another part of the invention consists in coating the inner ends of the spokes, or of any other instruments by which the nave and the fellow are united, with copper or brass, in order “ that when the nave is cast thereon the same may be more “ securely combined with the spokes.” The ends of the spokes are first cleansed by the use of an acid, then dipped into water and powdered borax placed thereon, and when dry made red hot and dipped into melted brass or copper with which they thus become coated, and the nave is then run upon them.

Another part of the invention consists in securing the outer ends of spokes in the holes of the ring, or fellow in which they have been placed by heating the spokes and the fellow, and then causing melted borax to run into the joints and afterwards melted brass or copper, the spokes and fellow being thus “ brazed ” together.

[*Printed, 8d. Drawing.*]

A.D. 1837, May 22.—No. 7376.

LEAK, ELIJAH.—Windows for carriages, &c. This invention consists in raising and lowering windows of carriages, buildings, &c. by means of racks attached to the sashes and worked by pinions turned by a winch.

The windows may also be fitted with waved racks, either attached to the frame or to the sash. Springs and rollers engage with these, so that the window may be retained in any position.

[*Printed, 10d. Drawings.*]

A.D. 1837, July 19.—No. 7404.

PEARSE, JOHN.—“ An improvement or improvements in the “ construction of wheels.”

In this invention wooden spokes are combined with diagonal stays “ in such manner as to act on the double principle of “ sustaining the weight of the load from above by suspension,

“ and from below the nave by propping,” the diagonal stays being so applied as to “ take the side strain of the load on the “ wheel.”

An arrangement is described in which the spokes of the wheel are straight, but have combined or united with them stays which are curved outwards, both the inner ends of the spokes and those of the stays being of dovetail form, and being secured in the nave of the wheel (which is of considerable length) by wedges of wood, into which are driven thin wedges of iron. The outer ends of the spokes are variously formed, but are in all cases so combined with the felloes that “ they will not be able to be drawn in towards the nave by “ the load,” pins or dowels of iron connecting the spokes with the felloes, and the latter being surrounded by an iron ring or tyre which is “ shrunk on in the usual way.”

[*Printed, 6d. Drawing.*]

A.D. 1837, November 4.—No. 7457.

IREMONGER, RICHARD JOSHUA.—“ An improved spring or “ arrangement of springs for wheel carriages.”

This invention consists “ in making the spring or springs of “ wheel carriages of such forms, and placing or arranging “ them in such manner in connection with the axles or axle- “ beds that when impinged upon or put in motion they vibrate “ in a curvilinear direction round the points of suspension of “ the body of the carriage, whereby the concussions to which “ the wheels, axles, and axle-beds are subject from the in- “ equalities common to the surface of all roads, and from “ occasional obstructions, are intercepted by the said springs, “ and more effectually diverted from the carriage bodies than “ by any other mode heretofore in use.”

Various modes of carrying the invention into effect may be adopted, one arrangement being described in which a “ bell crank spring ” is connected at the lower end with a “ gallows ” fixed upon the hinder axle-bed of a carriage, the upper arm of the spring being joined to a “ scroll standard,” rising from the perch of the vehicle, the elbow of the spring being attached to a loop bolted to the body of the carriage, such elbow thus forming “ at once the fulcrum or centre of the spring and “ one of the points of suspension of the carriage body.”



Moveable quadrants, drum springs, and other mechanism are also mentioned as being applicable in carrying out the invention.

[*Printed, 5d. Drawing.*]

A.D. 1837, December 5.—No. 7497.

COTTAM, GEORGE.—Wheels for “railway and other carriages.”

This invention “relates to certain modes of constructing wheels for carriages for railways or roads, and for turnpike roads, whereby the welding of the spokes with the outer ring may be performed with greater facility than heretofore.”

Several modes of carrying out the invention are described, but the main feature of the invention consists in rolling bars of iron with one or more ribs projecting from the surface and then welding the spokes of the wheel to such ribs so that the bars may constitute the tyre of the wheel. These tyres may either be flat on the outside and thus be suited for use on common roads, or they may be flanged so as to be suitable for use on railways and the spokes may be variously formed, being in some cases double and further apart at the nave of wheel than at the point at which they are welded to the rim or tyre. The nave of the wheel may either be cast upon the spokes or be otherwise formed and sheets of steel, or steel and iron filings may be used to ensure an effectual welding of the spokes and the ribbed bars. One mode of carrying out the invention is described in which the wheel, as being formed, is mounted upon a vertical axis on one side of which is a forge and on the other an anvil, the wheel being thus constantly heated at one point and hammered at another.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1838, January 31.—No. 7559.

PEPPERCORNE, GEORGE RYDER.—Attaching horses to carriages. The object of the inventor is to support the greater part of the weight of the animal drawing the carriage, in order that its fullest power may be applied to purposes of draught alone. For this purpose the horse is supported in a two wheeled carriage connected with the main carriage. The

axle is bent and passes over its back, and this axle is fitted with a spring bar apparatus from which the horse derives its suspension. This bar is raised to the proper position by a lever and winch, or by analogous means. A peculiar saddle for the horse is described. There may also be an under bent axle in addition to the former axle. This passes from side to side underneath the horse.

A method of guiding the conjoint carriage by means of a vertical rod at the point of connection with a horizontal pulley below, is described. Also what the patentee calls a "traversing perch" bearing at each end upon the centre of the axles. These axles traverse in slots in the perch.

The invention also relates to a brake or skid, acted on from the driving seat. The brake blocks or skids are small wheels at the ends of a horizontal bar worked by rods from above and connected with springs under the carriage. A cord is used, operated by a pulley on the axle or elsewhere, to draw the blocks to the wheels and, if great friction is required, by tightening the cord the action of the wheel will draw the brake between the periphery of the wheel and the roadway.

[*Printed, 10d. Drawing.*]

A.D. 1838, February 21.—No. 7571.

GRIME, JEREMIAH.—Wheels. This invention consists firstly, "in the particular arrangement and disposition of such parts as are necessary to form the wheel, which is to be entirely constructed of wrought iron; and afterwards, by means of suitable machinery or apparatus, the whole is to be compressed and welded into a solid wheel, and during such latter process the felloe, with its flanch, and the spokes and nave or boss, will all be so perfectly united by the working or welding of the metal that no joint, imperfection, or weakness will be perceptible; but as the wheel will be thus rendered into one mass of wrought iron, and the flanch formed upon the same piece or bar as the felloe, the necessity of a separate tire iron is dispensed with, and consequently the outer rim or periphery of the wheel is more durable, as it is impossible that the flanch or tyre iron can work off or become loose, it being all welded into one mass."

Various modes of carrying out the invention are described, in some cases a number of plates being "piled" together in forming the wheel, the arrangement being such that the grain or "end of the iron" shall always cross or diverge from the centre of the wheel, thus rendering the wheel stronger and more durable. In other cases the wheel consists of bars of wrought iron, the grain of the iron being so arranged as to "present itself to the rail or road upon which the wheel runs." In other cases a rolled bar forms the felloe of the wheel, the nave and arms being formed of piled plate iron or partly of plate and partly of bar iron.

Wheels are also described as being composed of a felloe of solid bar iron, having a flanch formed on its periphery and being connected with the nave by helically coiled springs, this arrangement reducing the concussions given to the carriages in passing over irregularities in the road or way.

The machinery employed in forming these wheels is described in detail and includes apparatus for punching holes out of plates of metal in order to form the spaces between the spokes or arms of the wheel, a cutting tool connected with the shorter end of a lever and also certain "shears" being employed in this part of the invention. Apparatus for heating and welding the metal composing the wheels is also described this much resembling a reverberatory furnace in which the metal intended for the wheels is made to revolve slowly while being acted upon by a "rammer" or other suitable tool; this apparatus being applicable not only in the formation of new wheels, but also in the repairing of old ones.

[*Printed, 1s. Drawings.*]

A.D. 1838, February 24.—No. 7575.

HOULSTON, JOHN.—"Improvements in apparatus for stopping " or retarding carriages."

This invention "relates to a mode of applying friction " springs to the axletrees of wheels of carriages, and by such " arrangement of the friction springs, the same being " enclosed, the parts are not liable to get deranged, the " admission of dirt, as is the case with other retarders, being " thereby prevented."

An arrangement is described in which there is applied to one of the wheels of a coach a box or case within which is a

curved spring, one end of this spring being carried by a piece of iron keyed to the axle, and the other end of the spring being pinned to a crank which is mounted on a separate shaft, and from which a rod proceeds to the seat of the coachman or guard, such rod being furnished at the upper end with a rack, in gear with which is a pinion, by turning which, by means of a handle provided for the purpose the crank presses the spring against the interior of the box or case. A catch is arranged inside the box "to prevent the wheel moving backward should the horses jib," and a plate fixed on the axle "incloses the apparatus, so as to keep out dirt, dust, or other injurious matters." The invention may be applied, if necessary, to all the wheels of the vehicle.

[*Printed, 6d. Drawing.*]

A.D. 1838, April 21.—No. 7619.

MACNEE, JAMES.—"An improvement or improvements in carriages."

This invention consists "in a new and improved method of connecting the fore part with the hinder part of any four-wheeled carriage or vehicle, that is, the parts commonly called the fore carriage and hind carriage, by means of a perch bolt placed at a greater distance behind the fore axle than has hitherto been practicable with what is termed the full locking wheel," and also by means of what the patentee terms "a segmental plate placed at a considerable distance in front of the perch bolt, and which segmental plate is connected with both parts of the carriage; as also in those cases in which the foot board may rest on the one part of the carriage and the seat on the other, in communicating such motion to the seat as shall maintain it always in its proper position with reference to the foot board."

The patentee states that by these arrangements, "when the fore carriage is turned on its centre in the process of locking, the wheels and axle revolve round it in such manner as to throw the inner wheel clear of the carriage, and thus admit of a wider lock with a given size of wheel, or a larger wheel with a given degree of lock, than by the old method, where the perch bolt was placed farther forward." He further states that he does not limit himself "to any particular circle, or segment of such circle, nor to

“ any particular form or dimensions of bolt or other connection,” by which the improvements may be carried into effect, as various “ modifications may be adopted with the like effect.”

[*Printed, 10d. Drawing.*]

A.D. 1838, May 3.—No. 7631.

BALL, JOHN.—(*A communication.*)—“ Improvements in carriages.”

The object of this invention “ is to decrease friction of the draft of wheel carriages,” and the invention consists “ in a mode of applying friction rollers to the axletrees of the wheels of carriages.” The friction rollers “ are applied to the axletrees, and the axletree boxes revolve on the friction rollers; hence the friction rollers remain stationary as to position with the axletrees to which they are applied, and they reduce the friction of the axletree boxes by supporting such boxes, and touching at only very small part of the inner circumference of each of the boxes.”

An arrangement is set forth in which three friction rollers are employed, such rollers having “ necks ” at each end, on which they turn as axes. Hollow bearings of steel, or other suitable metal, are let into grooves or recesses in the axletree, such grooves or recesses also receiving the friction rollers, the arrangement being such, however, that the rollers do not touch the axletree, certain collars being so contrived as to receive the necks or axes of the rollers. The axletree box is cylindrical, and hardened on its inner surface, the friction rollers revolving freely within this box, and there being a screw plug at the end of the box which which may be removed when it is desired to lubricate the parts. A ring projecting from the axletree, and a circular plate at the inner end of the axle box, keep the wheel in its place on the axle.

[*Printed, 9d. Drawing.*]

A.D. 1838, June 2.—No. 7666.

HARDY, JAMES.—“ Certain improvements in rolling making, or manufacturing shafts, rails, tire iron, and various other heavy articles of metal and in the machinery or apparatus used in the same.”

This invention consists in adapting the principles set forth in the specification of a former patent granted to the present inventor in 1835, No. 6807 “for manufacturing axle-trees for  
“carriages and other cylindrical or conical shafts, and apply-  
“ing the same principles to the manufacturing of certain  
“articles, as square or polygonal shafts for machinery rails  
“for trams or railways, and the tire irons for wheels, and  
“various other articles, by a certain process of rolling bars  
“of iron to certain figures, and after fagotting such rolled bars  
“together bringing them into the required form by rolling  
“or by swages attached to a tilt hammer or metal helve.”  
The patentee introduces “as portions of the said mass of  
“metal, longitudinal bars of steel in such situations as may  
“be required for particular purposes,” and rolls or welds  
“these steel bars into combination with the iron.”

Also instead of continuing to pass the masses of metal between rolls always revolving in one direction, the rolls may be reversed after every operation.

[*Printed, 7d. Drawing.*]

A.D. 1838, June 7.—No. 7677.

THOMAS, ROBERT.—“Certain improvements in apparatus to  
“be attached to carriages for the purpose of preventing horses  
“from starting, and for stopping or restraining them when  
“running away or descending hills.”

This invention consists “in the adaptation of an apparatus  
“to carriages, whether on two or four wheels, by means of  
“which the horse or horses may be drawn, so as to prevent  
“their proceeding, by means of a cord to be connected to  
“the bit or curb, such cord being wound round a rotary  
“barrel, when the barrel has been thrown into gear with one  
“of the running wheels, which may be done by any person  
“riding on or in the carriage.”

An arrangement is set forth in which a shaft, capable of rotation, is supported by brackets fixed to the stationary axle of a carriage. A small tube, attached by means of a flange to a larger tube, and a spring embraced by the larger tube, form a portion of this part of the invention, there being combined with these certain worm springs, and there being upon one end of the shaft a spur pinion, which, upon the shaft being

made to slide endwise in the brackets, is brought into gear with a ring of teeth fixed upon the nave of one of the bearing wheels of the vehicle, the apparatus being thus made to cause the larger tube to coil up a band or cord which is connected by a pair of branch cords or reins with the curb or bit of the horse's mouth, as also, if required, with the bearing rein and the loops passed over his ears. The invention is described at some length, the details thereof including a pin and clutch, and other apparatus by which the apparatus is in the first place brought into action. As a security against the horse rearing up on being checked by the apparatus, loops of catgut or cord are applied over his ears, which will be brought tight upon them when the apparatus is applied, coiled springs afterwards releasing the loops; a spring barrel and a second cord, being interposed between the tube and band first-mentioned and the horse's curb or bit in order to prevent the action of the apparatus from being too sudden.

[*Printed, 1s. Drawings.*]

A.D. 1838, August 31.—No. 7792.

CURTIS, JOSEPH.—Propelling carriages and improvements in wheels, &c. The patentee describes a carriage propelled by animal power. The horse or other animal is supported in the framing of the carriage by means of a broad sling or band. His fore feet work treadles which by connecting rods and cranks turn the driving axle. The fore feet are separated by a vertical plank to prevent the wrong foot being placed on either treadle and there is also described a ratchet apparatus which may be substituted for the crank motion for the purpose of making it immaterial whether a short or long step is taken. A modification of this carriage is also shown, in which the horse is to adopt an ordinary progressive action, the boards on which he stands communicating the movement to the driving axle through a kind of parallel motion. The patentee also describes a method of slinging a horse in a carriage so that after it is started, the animal may be raised so much from the ground that his feet can only touch sufficiently to enable him to take long galloping strides, like a man on a velocipede.

Another improvement relates to the construction of a wheel

for common roads or railways. This wheel is formed "as if the conical railway wheel were placed outside of the common wheel. If the wheel be formed of wood, the fellies should be broad enough to take both tires. The outside tire may be the same as that used for a railway wheel, and the road tire the same as usual." The patentee states that the best mode of fixing the spokes "will be alternately to cross them" and that the nave would be best of cast iron "in the usual way." He also states that the only part of the wheel which he claims is "the form of the ring," and that the best mode of forming the ring is to make the wheel in the usual way, and then shrink the railway tire upon it, and then when this is turned in the lathe, and the edge likewise, the road tire may be shrunk on afterwards; "or the iron tire may be rolled to the entire shape and the wheel put together upon the usual railway system."

[*Printed, 3s. 8d. Drawings.*]

A.D. 1838, September 6.—No. 7795.

BOURNE, JOHN FREDERICK, and BARTLEY, JOHN, jun.—  
"Certain improvements in the construction of wheels to be used upon railways and other roads, and which improvements are also applicable to the construction of wheels in general." The invention consists, firstly, in a "peculiar method of preparing and putting together the ordinary parts of such wheels, as the felloe, spokes, or naves; and, secondly, in the application of certain machinery or apparatus for the purpose of bending the tyre, hoop or rim of locomotive engine, or other wheels to be employed upon railways, or of any other wheels where loose or separate tyres are used." In forming a railway wheel, a nave is first constructed of either two pieces of bar iron bent into a circular figure, or "by taking a solid mold from the forge" and cutting or working it as requisite, these being then welded to such nave pieces of flat bar iron of half the length of the intended spokes of the wheel, the edges of these bars standing "in the direction of the running course of the wheel." To these, again, are then welded other pieces of bar iron, to the outer ends of which have been previously welded curved pieces of metal, forming segments of the intended felloe or rim of



the wheel, and then two of the portions of wheels thus fabricated are placed together, with the spokes intersecting each other, and the whole is welded together, forming a complete wheel, the two sets of spokes having been previously dished so as to approach each other at the ends, and "V-pieces" being inserted at the points of junction of the segments forming the rim, a tire or outer rim being then shrunk thereon, or such rim being turned "to the proper cone and flanch."

Instead of flat bars being used for the spokes of the wheel, round bars or other forms of metal may be employed, and other variations in the details of the arrangements made, as may seem most suitable. Thus a wheel may be formed by first preparing a straight bar (either flat upon its surface or made with a flanch, as upon railway tires,) of the full length of the periphery or felloe of the intended wheel, "and 'jumping up' or welding one half of every spoke or arm at equal distances apart from the straight bar or tyre;" or the arms may be "welded upon the tyre bar in their whole length" and such bar bent to form the felloe; a nave being afterwards cast upon the inner ends of the arms. Or a rim or felloe of wrought-iron may be provided with holes into which the outer ends of spokes may be inserted, and rivetted while in a heated state, a nave of cart-iron being afterwards run upon the inner ends of such spokes; either single or double sets of spokes being provided according to the proposed strength of the wheel.

The mechanism employed for bending the metal intended for the tires of wheels consists essentially of framing which supports upon the ends of shafts two grooved rollers, which are meant to act upon the flanch portion of the tyre, and a third roller, which has a plain surface and forms "the flat under surface" of such tire, and is capable of being placed at different distances from the others, according to the thickness and curvature of the tire under operation, the first named rollers being driven by suitable gearing, and the tire iron being supported while under treatment by "a light platform of rollers" arranged for the purpose. By an instrument enrolled on the 2nd of July 1847, the patentees disclaimed the application of this invention to "the bending of any tyre for wheels other than flanch tyre for railway wheels;" re-

moving also the words "and other roads" and the following portion of the title of the invention from the specification.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1838, September 13.—No. 7811.

McLELLAN, ARCHIBALD.—"Certain improvements upon the  
" springs and traces of wheel carriages, and upon the mode  
" of hanging such carriages."

This invention consists essentially "in the use of single  
" plate springs with metal braces, so applied that the weight  
" of the body is partly supported by tension from the said  
" springs." An arrangement is described in which a spring  
applicable to a gig or two wheeled carriage is formed of a  
single plate of steel, thirty-four inches long, two inches broad,  
" and three-eighths of an inch thick for six inches in its  
" centre, but thereafter decreasing uniformly in thickness to  
" one eighth and one sixteenth of an inch at the neck of the  
" eyes or ends of the spring, the eye itself being one quarter  
" of an inch in thickness." The ends of the spring, when  
only supporting the body, "rise gradually, curving upwards  
" to the extent of an inch, or thereabouts, higher than at the  
" centre, while not more than four inches in the centre of  
" the spring ought to be embraced by its fastenings to the  
" axle." To the ends or eyes of the springs are attached, by  
means of bolts, iron links or shackles "one and a half inches  
" long betwixt the centres of the bolt holes, and a full quarter  
" of an inch thick," there being attached to these links metal  
braces made of hoop iron, which enclose brass or bell metal  
rollers, the whole of this apparatus being suspended between  
open ended scroll irons. The patentee mentions that the  
principle of the invention "lies not so much in the spring  
" itself as in the new and favourable position in which it is  
" placed by the braces."

[*Printed, 7d. Drawing.*]

A.D. 1838, December 1.—No. 7891.

DARTHEZ, STANISLAUS.—(*A communication.*)—Axles. This  
invention consists in fitting in recesses cut in the part of the  
axle which runs in the box or nave of the wheel, certain  
rollers the peripheries of which rub against the inside of the  
box or nave as the wheel rotates.

[*Printed, 6d. Drawing.*]

A.D. 1838, December 6.—No. 7896.

CAVAIGNAC, GODEFROY.—“Improvements in apparatus for  
“ transporting materials for various purposes from one place  
“ to another, particularly applicable to road cutting and em-  
“ bankments.”

One part of this invention relates to the construction of a waggon for the carriage of earth and other materials, and consists more particularly in arrangements by which the waggon may with facility be unloaded. The body of the waggon is mounted upon framework which projects upwards above the wheels, and such body is capable of turning upon a fulcrum so as to bring it into an inclined position, in which position the contents will be discharged by the swinging open of one of the sides of the waggon, which is suspended upon pivots or a fulcrum at its upper part, being retained in position when the waggon is loaded and travelling, by hooks which are inserted into staples in the ends of the waggon. The body of the waggon is moved into the inclined position necessary for discharging the contents by means of a “bent  
“ serrated piece of iron” or curved rack, with which a toothed pinion is in gear, such pinion being turned by a winch or handle when it is desired to unload the waggon, and serving also to restore the body to its horizontal position in which it is retained while necessary by a hook. The other parts of the invention do not require notice here.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1838, December 17.—No. 7906.

MOAT, CROFTON WILLIAM.—Applying horse powers to carriages. The carriage described in this Specification is designed for the purpose of relieving the horse of a part of its own weight. The horse is accordingly suspended by a broad band from the fore axletree bed, the wheels of this carriage being very large. The two pairs of wheels are connected by a perch passing over the top of the carriage, which is in two compartments on the hind wheels. The fore axletree bed also supports by suspension the shafts, pole, and a wooden shield between the horse and the wheel. There is also placed upon it a seat for the driver and the steering gear, used for the purpose of assisting the horses. This gear consists of a barrel round which a rope is passed, working the axletree.

A brake is fitted to the hind wheels and it is worked from the guard's seat behind the carriage. The hind axletree passes between the two compartments and the framing of the carriage is strengthened by ties. The pole and shafts are attached to the framing of the carriage.

[*Printed, 6d. Drawing.*]

A.D. 1838, December 21.—No. 7919.

STAFFORD, DANIEL.—“Certain improvements in carriages.”

Extension for the term of seven years from the 24th December 1838 of the Letters Patent granted to the present patentee, dated 24th December 1824, No. 5063.

[*No Specification enrolled.*]

A.D. 1839, January 3.—No. 7924.

DU MAURIER, LOUIS MATHURIN BUSSON.—(*A communication.*)

—“Improvements in the construction of springs for carriages.”

This invention consists “in a combination of levers and “slides in conjunction with peculiar shaped springs,” the patentee stating that the advantage derived from the invention is, “the lessening of the number of springs, and at the same “time preventing carriages, coaches, or any other vehicles “to which these improved springs may be applied, from “overturning, even though one of the wheels on the same “axletree were to be twelve inches higher than the other.”

An arrangement is described in which the body of a vehicle is supported by springs placed one above the other, the ends of the upper and larger spring bearing upon two friction plates which are screwed to a bar passing across the framing of the vehicle, and the ends of the lower spring bearing upon an elastic piece of metal connected to the same bar. Rollers may be placed at the ends of the springs “to render their “motion more easy.” In connection with the bar passing across the framing of the vehicle are two levers, which are each connected at one end to the springs by means of links or bridle pieces, while at the other end of each is a friction roller which is arranged to work within a curvilinear slide fixed to the axletree of the carriage, the result of the whole arrangement being that the body of the carriage is constantly maintained in a horizontal position although the wheels may

be passing over uneven ground. The details of the invention are minutely set forth, but may be varied.

[*Printed, 6d. Drawing.*]

A.D. 1839, January 19.—No. 7944.

DUGDALE, RICHARD. — (*A communication from Alexander Riend.*)—Axles. This invention consists in making such articles as are exposed to sudden shocks, or great and irregular strains, such as carriage axles, mill shafts, or ships' anchors, "by making the same of two concentric pieces welded together at the end or otherwise secured one within the other, and whether both of the said pieces are hollow, or one of them only, whereby the force of the shock or strain becomes dispersed throughout the external piece without materially affecting the inner, and any tendency to fracture arising from an accidental flaw or imperfection in the metal is confined to the piece, whether outer or inner, in which it occurs, and does not extend through the whole thickness of the beam, rod, shaft, or other article."

The specification of the invention is accompanied by a drawing illustrating the application of the invention to a carriage axle, a mill shaft, and an anchor respectively.

[*Printed, 5d. Drawing.*]

A.D. 1839, January 29.—No. 7956.

WILLIAMS, CHARLES JAMES BLASIUS.—"Certain improvements in two-wheeled carriages."

This invention relates to a mode of hanging the bodies of two wheeled carriages in such manner that "the weight of the carriage shall as much as possible hang on the axle and not press on or under the horse, except when its so pressing may assist his action, or be convenient to the driver, whereby also the body of the carriage is rendered less liable than those of common construction to be affected by roughness or irregularities in the motion of the horse, or from shocks or impediments on the road." The patentee sets forth the chief principles, on which the invention rests as follows:—  
"First, to suspend the springs from or on the axle or the body of the carriage from the springs by an attachment permitting a limited extent of motion, which to an equal

“ extent renders the carriage independent of the shafts and  
 “ wholly dependent on the axle ; second, to limit this motion  
 “ by stays, which, by making the weight to bear on the shafts  
 “ from under instead of from above the axle, reverses what  
 “ takes place in common two-wheeled carriages, and throw  
 “ the weight on the horse’s back in going up hill, and take it  
 “ off the back in going down ; third, to balance the weight  
 “ of the carriage at the axle, and when from a variable po-  
 “ sition of the weight which the carriage bears its balancing  
 “ point is not fixed, to make this point moveable by a sliding  
 “ attachment of the body to the carriage, which permits it to  
 “ be shifted a little backwards.”

The patentee states that there are “ many and various ways  
 “ of working out these principles,” but describes several  
 arrangements as suitable for the purpose, one of which he  
 distinguishes as the “ chain hung under poise ;” another as  
 the “ double pivot hung underpoise,” and a third as “ the  
 “ X-spring underpoise,” all of which are set forth in detail.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1839, February 28.—No. 7983.

POOLE, MOSES.—(*A communication.*)—“ Improvements in  
 “ constructing and applying boxes to wheels.”

This invention relates to a mode of constructing the axle-  
 tree boxes of carriage wheels, whereby such boxes will be  
 more securely prevented from leaving the wooden naves of  
 such wheels than when arranged on the ordinary system,  
 according to which the axle boxes are formed with longitudinal  
 webs or projections, and affixed in the naves of the wheels by  
 means of wedges. According to the present invention the  
 boxes are each formed with a screw in its external surface, so  
 as to be screwed into the nave of the wheel ; such screw either  
 being formed upon the box when cast, or afterwards produced  
 by cutting with proper tools.

[*Printed, 3d. No Drawings.*]

A.D. 1839, March 6.—No. 7993.

CLARK, JOHN.—Propelling carriages on common roads.  
 The principle of this invention is thus described by the  
 patentee :—“ My improvement and invention consists of a

“ new and improved form and construction of a leg and foot  
“ for propelling carriages on rail or common roads ; and,  
“ secondly, in a new combination or arrangement of machinery for locomotive carriages, by means whereof the  
“ weight of the load to be carried is rendered applicable  
“ as part of the power for moving or propelling the carriage  
“ on which it is supported or rests.

“ For the purpose of carrying my improvement or invention  
“ into effect, two frames or carriages must be constructed  
“ distinct and separate from each other. The first or number 1 to consist of a certain framework made of iron or  
“ wood, with machinery attached, and to which the axletrees  
“ of the road wheels are attached, and the second or number 2, to consist of a strong framework for the support of a  
“ coach, cart, waggon or any description of carriage, to  
“ which framework four wheels are made freely to turn on  
“ axles firmly attached to the said framework.

“ To the framework of carriage number 1 are affixed bearings, in which two shafts, each carrying eight cranks or  
“ eccentrics, revolve and to each of these cranks a leg and  
“ foot is made freely to play and to the extremities of the two  
“ shafts are attached four cylindrical wheels, within which  
“ the four wheels attached to carriage number two are placed ;  
“ and thus the total machine consists of two carriages number 1 being supported on wheels resting on the ground, and  
“ number 2 having its wheels in cylinders attached to the  
“ framework of carriage number one.

“ To cause this united machine to advance, the four wheels  
“ attached to the framework of carriage No. 2, are, by the aid  
“ of a steam engine, made to revolve in the cylinders in a  
“ backward direction to the carriage No. 1, to which these  
“ cylinders are attached, and thus these wheels belonging to  
“ the carriage No. 2, are by the rotary motion communicated  
“ by the steam engine continuously attempting to advance ;  
“ but immediately they are propelled or removed from the  
“ points on which they rested, their weight with the load they  
“ support is brought to press on the inner circumference of  
“ the cylinders at points removed from the centre of gravity  
“ of the said cylinders, and consequently as the wheels of the  
“ carriage No. 2 have trundles and cogs running on rims and  
“ cogs forming the inner part of the cylinders, the weight of

“ the carriage number 2 thus applied must give to the cylinders a rotatory motion, or the resistance by which they are withheld must be equal to or superior to the powerful revolving force exerted by the wheels of the said carriages number 2 running therein.” By this arrangement of the carriages Nos. 1 and 2 “ the cylinders become a sort of endless railway constantly descending or turning as the weight revolving therein is more or less removed from their centre of gravity in proportion as the resistance to be overcome may require.

“ The weight thus applied to the cylindrical wheels is also brought to act on the legs which being attached to the cranks or eccentrics on the same shaft, are consequently, as the cylindrical wheels revolve, pressed alternately at different angles against the ground in a line to push and cause the road wheels of carriage No. 1 to revolve in a forward direction, and thus the weight of a coach, cart, wagon, or any description of vehicle with the load it carries, by having its wheels placed in cylinders attached to another carriage or framework supported on wheels resting on the ground, is brought to act as a propelling power to the carriage on which it rests, and from which it endeavours to escape are counteracted by cylinders revolving in equal times through equal spaces that the wheels of carriage No. 2 would have passed through provided they had revolved or rolled on a plain surface.”

[*Printed, 1s. 9d. Drawings.*]

A.D. 1839, April 9.—No. 8026.

PARKIN, THOMAS.—Carriages, wheels, &c. Part of these improvements consist in modifying a carriage so that the horse may be entirely raised from the ground while descending hills, brakes being added to retard the velocity, “ whereby the carriage may be safely allowed to run down hill by its own gravity at a speed considerably greater than the safety of the horses would otherwise permit.”

Another part of the invention relates to wheels meant exclusively for travelling on railways.

Another part of the invention relates to the wheels of carriages which are meant to run alternately upon common roads and upon railways; and consists “ in combining a felloe or



“ tire of iron to run upon the common road with a fellow  
 “ composed of short blocks of wood, having the grain nearly  
 “ in the direction of the radius, secured to the side of the iron  
 “ fellow, the wooden fellow to run upon a railway placed on  
 “ the common road, the iron fellow being of larger diameter  
 “ than the wooden fellow, for the purpose of forming a flanch  
 “ to prevent the wheel running off the rail, and of keeping  
 “ the wooden fellow clear of the ground when running on the  
 “ common road.” Wheels for common roads are constructed  
 by making the outer part of the fellow of two rings composed  
 of wood bolted side by side through a rib projecting from  
 the middle, and constituting a part of an inner fellow of iron.  
 The invention is described at considerable length, and includes  
 other particulars which do not require notice here. By two  
 disclaimers, one of which was enrolled on the 27th of April,  
 1841, by the above-named Thomas Parkin, and the other on  
 the 24th July, 1843, by Thomas Harper Bennet, to whom the  
 patent appears to have been assigned, all the particulars  
 mentioned above, as well as a number of others, were dis-  
 claimed.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1839, April 13.—No. 8031.

GILLOTT, JOSEPH, and WALKER, THOMAS.—“ Improve-  
 “ ments in engines and in carriages to be worked by steam or  
 “ other motive power.”

Part of this invention relates to an improved mode of  
 “ combining the mutual action of the wheels and axletrees of  
 “ carriages, the object of which is to make one wheel of each  
 “ pair of wheels fast to their axletrees, so that they shall both  
 “ revolve together while the other wheel of the same pair  
 “ shall run loose on the said axletree.” By this arrangement  
 “ whenever the two lines of rail or road over which the pair  
 “ of wheels roll depart from right lines” “ each individual  
 “ which will be at liberty and disposed to take those varied  
 “ velocities which the undulations or curves require.”

The funnels of locomotives are to be so contrived that  
 the cinders and dust are caused to be deposited in a water  
 tank.

For converting reciprocatory motion into rotatory driving  
 motion, a pin on the piston rod is caused to work in a spiral

groove cut on the inside of a cylinder, to the axis of which the flywheel is fitted.

[*Printed, 10d. Drawings.*]

A.D. 1839, May 13.—No. 8067.

POOLE, MOSES.—(*A communication.*)—"Improvements in reducing the friction of axletrees and axletree boxes, and other such moving parts of machinery."

This invention consists in certain modes of placing around the moveable parts of machines, such, for instance, as the axletree of a wheel, a series of steel or other metal balls or spheres, "which turn with them, and do not offer any resistance, care being observed that they are so placed as not to touch each other, as that would give a different motion to that already communicated." The first mode of carrying out the invention consists in placing three rows of balls at equal distances around the axle of a carriage and inside the nave or boss of the wheel. Each row is composed of six balls, and each row rests upon two small axles, which are parallel with the axle of the carriage, "in such a manner that each ball touches upon three different points situate at equal distances the one from the other," the small axles resting upon plates of metal at the two ends of the box of the wheel, and being fixed by screw bolts. Another mode of carrying out the invention consists in "having two circular metal recesses placed at each end of the box of the wheel, placed parallel to one another; the axis of these recesses is the same as the axletree. Within these recesses are four balls of steel, upon which the axle rests; between these balls are four moveable rollers, which prevent the balls from coming into contact with one another." To each of these rollers is attached another roller of a larger diameter, both moving on an axis which is fixed to an iron ring, the larger rollers working in the upper parts of the recesses, steel rings being placed around the axle to keep the latter in its place. "In place of balls, cylinders without axes may be used, but not so advantageously."

Another part of the invention relates to a mode "of checking and stopping the wheels of carriages when rapidly descending hills." This is effected by means of semi-circular pieces, two of which are placed around the nave of

each wheel, and so jointed to each other and connected with bars passing across the vehicle between the wheels, that by a very slight movement being given to a long lever connected with the apparatus the semicircular pieces may either be pressed upon the naves of the wheels and so retard or stop their motion, or be removed therefrom. The bars mentioned above are supported by straps or bands fixed to the axles, and are made of sufficient strength to support the vehicle in case of the breaking of the axle.

Another part of the invention relates to a mode of fixing an axletree within the nave of the wheel. There is a metal plate fixed at the back of the nave of the wheel by four screw bolts which pass into holes in the box before the nave. “This metal plate is placed at the centre, in order to form a round box of the necessary depth to allow for the thickness of the end of the axle; near the back of this plate are two pieces which are connected with the other plate and form an angle, in order to receive two other metal plates which slide towards the centre of the nave and so retain the end of the axle. These slides are kept in their proper places by means of screws. When it is required to take off the wheel it will be seen that it is only necessary to unscrew the small screws, and the two pieces which form the slides will open without leaving the metal plate.”

[*Printed, 10d. Drawing.*]

A.D. 1839, May 20.—No. 8070.

BODMER, JOHN GEORGE.—Machinery for cutting, planing, turning, drilling and rolling metals.

This specification is very lengthy and deals with many subjects. Part of the invention relates to a method of rolling wheel tires. The tire is first roughly welded out of a thick bar, to a diameter considerably less than that which the finished wheel is intended to have. It is then placed between two short rolls placed at the ends of shafts supported in suitable cheeks or frames. The rolling operation is then begun and continued until the tire runs on a series of small rollers held in a circular frame placed in an excentric position around the rolls. This frame is then opened on hinges and the tire removed.

A disclaimer dated the 12th May 1853, was entered by Thomas Hornby Birley, assignee of the letters patent. This

disclaimer did not affect the part of the invention above referred to.

[*Printed, 5s. 2d. Drawings.*]

A.D. 1839, June 6.—No. 8092.

PRIOR, WILLIAM.—“Certain improvements in the carriages  
“ and axletrees of wheel carriages.”

This invention relates in the first place to a mode of constructing the axletrees and fore carriages of four-wheeled vehicles so as “more advantageously to obtain the locking  
“ motion.” Instead of the fore wheels of the carriage being fixed to and supported by the bed in the usual manner they are mounted on two jointed arms at the two ends of the bed with which they are connected, by which means the wheels turn or lock nearly on their own centres, and thus “when the car-  
“ riage is turned or locked to its greatest extent it will always  
“ rest on four points of support, and is thereby rendered less  
“ liable to be overturned or upset than carriages in general,” which, when the wheels are much locked, “may be said to  
“ rest only on three points.” By this arrangement the distance between the wheels is considerably reduced, which allows of the body of the carriage being suspended or hung between the fore and hind wheels, “with the doors exactly in  
“ the centre, which adds greatly to the elegance and general  
“ appearance of the carriage.”

Each wheel has a separate short axle, composed of steel, one end being formed into an arm, and the other into a hinge carried by the axle bed. With each axle is connected a wheel iron, these proceeding from and being attached to a horizontal bar, which is so constructed that on the movement of the pole or shafts towards either side in turning the carriage the axles make a corresponding movement, various stays and other mechanism forming parts of this portion of the invention. The axle box is formed of wrought or cast iron, bored so as to fit the arm, but recessed about midway for the reception of oil or other lubricating matter; and also furnished with a groove for the reception of a collar formed upon the axle arm, and certain caps, screws, and other details completing the arrangement, which, however, will not be thoroughly understood without an inspection of the drawings annexed to the Specification.

The invention further includes “a double counter-acting  
“ scroll spring,” which consists in effect of two springs com-

posed of steel plates and connected at the ends by shackles, the patentee mentioning various advantages as arising from the use of this spring, one of which is that a carriage furnished with these springs may be without a perch. An improved blind for carriage windows, which is composed of wire gauze strained upon a suitable frame, is also described, and the invention further includes a mode of constructing hinges for carriage doors, each hinge consisting of a flat bolt affixed to the door, two plates of metal in the framing of the door forming between them a recess for the reception of a pin on which the plate turns. A "revolving body loop," and a mode of fixing or suspending the body of a carriage upon what the patentee terms "accelerating bars," are also set forth, but these as well as the other parts of the invention, will only be understood with the aid of the drawings annexed to the specification.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1839, June 18.—No. 8113.

BENHAM, JOHN LEE.—Counting passengers. Two forms of apparatus are described. One consists of an arrangement of hinged seats, by the side of which is a vertical rod carrying an arm at its top. This arm normally places itself across the seat so as to hinder anyone sitting down. To free the seat a counter, which the passenger receives on entering the vehicle, is dropped down a passage at the back of the seat and this forms a filling piece to the apparatus and enables the seat to work for the one passenger, after which the counter falls to a receptacle for the purpose.

Another apparatus is described by which a counting and sounding instrument is put in motion by the weight of the passenger mounting on the step of the carriage. The patentee does not claim this apparatus, but he does claim the use of a hinged flap to the step for the purpose of preventing anyone getting in or out without the consent of the conductor.

[*Printed, 1s. Drawings.*]

A.D. 1839, June 29.—No. 8136.

POOLE, MOSES.—(*A communication.*)—"Improvements applicable to wheeled carriages."

This invention relates in the first place to arrangements for

registering the number of persons who may enter an omnibus or other public carriage. This part of the invention is described under various modifications, in some cases the door of the vehicle, in conjunction with moveable passengers and conductors' steps, certain ratchet wheels, wires, rods, and other mechanism, actuates a hand which traverses a dial; this part of the invention including the application of leather or other flexible material for covering the crevices between the moveable steps, and so preventing wedges or other articles from being inserted into such crevices to check the action of the parts. In another case the door of the vehicle carries a turnstile which is made to work suitable registering mechanism, while in other cases some obstacle is placed at the entrance to the vehicle, which, being displaced or disturbed by the entrance of a passenger, gives motion to registering apparatus, the latter consisting in some cases of mechanism by which a pencil is made to describe marks upon a strip of paper.

Another part of the invention relates to the construction of springs for carriages, and consists in the employment of circular pieces of metal, hollowed in opposite directions, and soldered together at their edges so as to form air-tight boxes, which may be used either singly or otherwise, in some cases a number of such boxes being placed one upon another, an eminence on the top of one entering a depression in the contiguous part of that next to it, and the several cases being thus retained in their relative positions. A piece of thin leather is also interposed between each pair of air-boxes, "to prevent undue friction."

"In order that each air box may in all seasons be well filled with air it should be immersed in a freezing mixture after the two plates are soldered together, and a hole previously made for the purpose in one of the plates near the circumference should be quickly soldered up without entirely withdrawing the air-box from the freezing mixture."

[*Printed, 1s. 6d. Drawings.*]

A.D. 1839, August 6.—No. 8187.

JEARRARD, ROBERT WILLIAM, the younger.—"Certain means of retarding wheeled carriages."

This invention consists essentially "in the application of a

“ friction band round a friction plate placed at the back of  
 “ the nave, which band is adjusted by screws to the friction  
 “ required, and acted upon by a bolt or bar projected from  
 “ the carriage and withdrawn by the operator at pleasure.”

An arrangement is described in which a circular friction plate is attached to the nave of a wheel, this being surrounded by a ring or friction band, “ put on in two parts, and “ united by screws and nuts.” These screws and nuts may be so adjusted as to give the amount of friction required, and in order to prevent such screws and nuts from being shaken loose, pieces of soft wood are interposed between the parts. Certain sliding bolts and other apparatus are so arranged as to be operated upon by a handle moved by the driver of the vehicle, or some other person, the frictional apparatus being thus brought into action when required.

[*Printed, 6d. Drawing.*]

A.D. 1839, August 13.—No. 8192.

HOLLOWAY, NELSON JOHN.—(*A communication.*)—“ An improved head for carriages.”

This invention consists “ in constructing a head for a  
 “ double-seated carriage in such manner that though made  
 “ all of one piece, or one permanently connected series of  
 “ pieces, it may nevertheless be at pleasure expanded over  
 “ the whole of the body part, or thrown wholly or partially  
 “ back, so that a double-seated carriage provided with such  
 “ an improved head may combine in itself all the advantages  
 “ both of a close and an open carriage, that is to say, may be  
 “ used either as the one or the other, and may be changed  
 “ from the one to the other with great expedition and  
 “ facility.”

A head of this improved description may consist of four, five, or six bows connected together and covered in the usual manner, except in certain cases. A carriage is described which is furnished with a head consisting of five bows, the arrangement of which is duly set forth. “ To fit a carriage  
 “ body for bearing or carrying a head of this description the  
 “ following additions to or alterations in it must be made.  
 “ First, the hind quarter door pillars must rise or project  
 “ from two to three inches above the elbows, and should these  
 “ pillars have been cut off short a block of wood of from two

“ to three inches in thickness must be firmly secured to the  
 “ top of each elbow, and as close as may be to the correspond-  
 “ ing pillar, taking care that the grain of the block runs  
 “ obliquely and that it is of width enough to stand out  
 “ fair with the outside of the elbow, and to receive inside and  
 “ hold fast the elbow trimming. Second, to the top of each  
 “ of the front quarter elbows, and at the extremities thereof,  
 “ there must be firmly secured a perpendicular iron stud or  
 “ holdfast” having near its upper end a hole for the reception  
 of a pin or bolt which is pendant from one of the bows, cer-  
 tain keys, plates, hinges, and other apparatus being used in  
 securing the parts together.

“ The open spaces between the bows may be filled in either  
 “ with curtains or glasses,” and the patentee describes dif-  
 ferent modes of arranging both, the details of the invention  
 being set forth at some length.

[*Printed, 1s. Drawings.*]

A.D. 1839, August 16.—No. 8197.

ADAMS, WILLIAM BRIDGES, and BUCHANAN, JOHN.—“ Cer-  
 “ tain improvements in the construction of wheel carriages,  
 “ parts of which improvements are also applicable to ma-  
 “ chinery for propelling, and also for the purpose of securing  
 “ ships and other vessels, and for communicating motion  
 “ between different portions of machinery.”

One part of this invention consists in a new mode of apply-  
 ing springs for the suspension of the bodies of carriages.  
 According to one arrangement a “ longitudinal extension  
 “ spring ” is used, such a spring “ being made of a flat bar  
 “ or blade of steel,” or any other suitable material, “ the  
 “ form being in all cases a curved or bended line,” and “ the  
 “ weight or force which the bearing springs have to sustain  
 “ being applied solely at the two ends of the curve of each  
 “ spring, and acting in the direction of an imaginary straight  
 “ line between the two ends of such spring.”

This part of the invention is described under various modifi-  
 cations, and the patentees include in their claims for invention  
 not only the application of the extension spring mentioned  
 above, but also the combination therewith of certain “ pointed  
 “ levers ; ” “ extension and compression springs ; ” “ twisted  
 “ blade springs ; ” “ sword blade springs ; ” “ C-bow springs ; ”



“ sugar-tongs springs;” and “ shifting fulcrum springs;” the latter being applicable not only as bearing but also as traction and buffing springs. Further, the invention includes the application of springs to “ vertebrated carriages,” such as those described in the specification of the patent granted to the first-named patentee on the 20th of October, 1836, the object of this part of the invention being partly to counteract the flexibility of the carriages; also a mode of enabling “ jointed “ bodied carriages “ to lock or turn about;” also a mode of constructing wheels for railway and other carriages, the flanges of such wheels, when required, being “ bolted on “ laterally;” also a mode of applying extension and compression springs as brakes or friction clogs for retarding the wheels of carriages on common roads; steering carriages; a mode of lubricating axles through the medium of a piece of sponge; a mode of constructing the axles and boxes of carriage wheels; “ with sliding collars for the boxes retained in “ place by springs;” a mode of applying the bodies of carriages upon cranked axles, or axles having cranked arms descending from them, “ so that the weight of the body will “ hang pendulum fashion on the lower part of the crank, on “ joint pins on the lower ends of the descending crank “ arms;” also a mode of “ causing a double seated body for “ a two wheeled carriage to accommodate itself in its position “ over the axles of the wheels, suitably for balancing the “ weight when the front seat alone is occupied, or when both “ hind and front seats are occupied;” also a mode of constructing the bodies of railway carriages “ with boards “ suitably united and combined, but without framing and “ panelling;” and likewise certain modes of “ constructing “ such cranked axles for carriages as are made of wood and “ iron combined, such combined cranked axles” forming part of the invention which was secured by the Patent already mentioned, this part of the present improvements “ being “ confined to the disposition of the iron plates flatways, “ upwards, above, and below the wood,” and also including a mode of applying a wooden bed to give strength to a cranked axle. All these particulars are set forth at some length, and illustrated by drawings containing a large number of figures.

[*Printed, 1s. 9d. Drawings.*]

A.D. 1839, August 17.—No. 8200.

KOLLMAN, GEORGE AUGUSTUS.—“Improvements in railways  
“and in locomotive and other carriages.”

One part of the invention relates “to the mode of constructing locomotive and other carriages to run on railways and  
“on roads, in order to their being adapted more advantageously to run in curved directions,” and the inventor claims, “constructing frames for carrying the locomotive  
“machinery, and also for carrying the bodies of railway and  
“other carriages, and the mode of applying springs thereto.” The framing of the carriage, or engine, is composed of two separate upper and lower frames connected by uprights; these frames, in fact, forming cages, placed one behind the other, within which the boiler and engine or body of the carriage may be suspended by means of springs connected with the upper frames, and suitable sliding guides descending to the axletrees of the wheels on which the carriage or engine is supported, these axles, however, being short axles working in bearings in the sides of the frames, and not passing across them. The two frames are connected by other frames called “perch frames,” necks or axes on the former entering openings in the latter, and the perch frames being themselves united by rods in such manner as to admit of the two parts of the apparatus adapting themselves to curves, there being in railways a central guide rail.

[*Printed, 9d. Drawing.*]

A.D. 1839, September 16.—No. 8219.

DODDS, ISAAC, and OWEN, WILLIAM.—Wheels and axles. This invention relates to various improvements in railway rolling stock, the above parts of which are capable of adaptation to common road purposes. The improved wheels “are  
“to be made principally, if not entirely of wrought iron.” A long bar is formed by rolling or otherwise, and is made smooth on the upper surface, but has certain indentations and recesses on the under surface for the reception of peculiarly formed spokes. The bar is to be cut into suitable lengths or pieces, and two of the spokes are to be welded to each piece. When that has been done, each piece of the bar is to be bent into the form of a segment of the felloe, and the spokes set truly

in radial directions ; so many of these portions of the bar and spokes as will constitute an entire wheel are then put together in a mould, and the nave or box of the wheel cast on to the inner ends of the spokes. The wheel having been thus formed, the junctions between the pieces or portions of the felloe are then to be welded together, and the wheel is complete, or the welding or uniting of of the portions of the felloe may be done before the nave or box is cast on to it. " If it " should be necessary to put a tire upon this wheel, that may " be done by rolling a long bar in the ordinary way, with " such a flange, if required, as will suit the particular rail- " way on which it is to be used. And when this tire bar " has been bended and welded into a correct circular form, " the tire hoop so made must be heated and then shrunk on to " the felloe of the wheel, and it may be further secured by " one or more small studs on the inside of the tire let into " the outer periphery of the felloe. In order to give greater " security to the tire so attached, it may be of advan- " tage to turn the outer periphery of the felloe to a slightly " bevilled form, and to roll or turn the tire iron to a corre- " sponding bevel with a shoulder," when " the tire being " then shrunk on, it will be impossible for it to be loosened " from its place by any vibrating action when in use." This wheel is furnished with two sets of spokes, placed parallel with each other.

In another mode of forming a wheel the spokes are first tapered at one end and enlarged at the other, the tapered ends being then welded to three collars or rings which furnish a nave for the wheel, one of these being between the spokes and on each side of them. A double set of spokes being thus formed, the latter are then bent so as to bring the outer ends of each pair together, these being then connected to certain " snugs " or projections formed in the interior of a circular tyre which has been previously prepared, and between which snugs the ends of spokes are secured by keys, and, if desirable, by punching the snugs into recesses in the ends of the spokes. This arrangement may be varied by forming each pair of spokes from one piece of metal, and welding the spokes to the tyre, thus dispensing with the use of keys, wedges being sometimes used in welding the spokes to the tyre, so as to give greater solidity to the wheel, or the tyre and spokes being

so adapted to each other that wedges will not be needed. A nave may also be formed of a grooved bar bent into a cylindrical form, the ends of the spokes being inserted into the groove, the latter being wider at the bottom than at the top, and the ends of the spokes of corresponding figure, and united to the nave by welding. One spoke may be passed further into the nave than the rest, to prevent them from slipping round in the groove, or such slipping may be prevented by a bolt passing through the nave. A multitude of other modifications of this part of the invention are described, the nave being in some cases of one piece of metal having a single flange on one side, against which the spokes are firmly held by a ring shrunk on the other, the outer ends of the spokes passing through mortice holes in a felloe, and being welded thereto, and a tire afterwards shrunk on the felloe. In other cases the wheel is composed of segment pieces, formed with flanges at the ends to facilitate the attachment of them to the nave or felloe, which attachment again may be produced in different ways. The nave in some cases may be formed of a bent flanged piece of metal, not welded at the joint, but a ring or hoop being shrunk upon the flanges of the inner ends of the segment pieces after they are placed around it, the felloe being composed of a ring, furnished with notches for the reception of the flanges of the outer ends, and a tyre being afterwards shrunk on around the whole. Or the nave may be grooved for the reception of the flanges of the inner edges of the segments, which are secured therein by a hoop, the flanges of the outer ends of the segments being also grooved for the reception of a rib on the inside of the tyre. A nave may also be formed of four segmental blocks "put together but not attached, and expanded by keys after the segmental pieces have been placed around it, and the felloe around them, rings being afterwards shrunk on the nave, and a tyre around the felloe, this tyre being further secured, if desirable, by bolts and rivets. A nave of cylindrical form is also described as having a rib around it against which the segmental plates are secured by rings, the outer ends of the plates being inserted into grooves formed in the felloe, which is heated and shrunk on to them, bolts and sockets here supporting and securing the sides of the plates. A nave may also be formed of metal cast upon the inner ends of the

segmental pieces. An improved mode of forming cranks and crank axles is described, in which the patentees, in order "to produce great strength and a more perfect tenacity of the iron, as well as facility of manufacture," "cut out from plates of iron, by a stamping press or other convenient means, any number of pieces to the form or figure of the article wanted, and then, having combined these pieces, weld them altogether into a solid mass."

[*Printed, 3s. 1d. Drawings.*]

A.D. 1839, December 21.—No. 8325.

RICHARDSON, HENRY FRANCIS.—"Improvements in the construction of omnibusses."

Before describing this invention the patentee mentions that the ordinary arrangement of omnibuses in which the passengers sit in two lines, face to face is inconvenient, and he then states that according to the present invention the passengers seats are along the centre of the omnibus, the passengers thus being placed back to back, and access from one end of the omnibus to the other being facilitated by hand rods or rails. Bells are also provided, "one on each side of the omnibus, with suitable tassels, by which any passenger can indicate a desire to communicate with the conductor without the disagreeable inconvenience of having to call out, with the chance of not being heard in passing along paved streets." The patentee mentions, in stating the advantages attendant upon this invention, "the circumstance of the passengers not having to sit with their backs to the windows, which at most times causes one of two inconveniences," the passengers being either "too much confined by having all the windows closed, or else persons sitting with their backs or sides towards open windows are liable to take colds."

[*Printed, 6d. Drawing.*]

A.D. 1840, January 1.—No. 8331.

NICOLAS, JOHN LEO.—Propelling carriages. By the rotation of a shaft upon which are arms or discs, the latter come into contact with props or levers which press against the ground and so propel the vehicle. The propulsion is effected by the thrust of these props under the action of the arms or

discs. As soon as their influence is removed, certain weighted levers act on the props and raise them from the ground.

In marshy soils these props thrust against wooden floats roughened to afford hold, and laid on the ground for the purpose. While the thrust is being made the wheels of the vehicle are on the floats and hold them securely. After the thrust is completed, the floats are picked up, carried forward by an endless band and again deposited.

The invention also relates to a method of working the abutments of rotary engines, and also to a "manner of effecting the reverse motion of the engine by means of an extra set of valve boxes, each box being furnished with a double set of valves."

*[Printed, 1s. Drawings.]*

A.D. 1840, January 3.—No. 8333.

GREENWAY, CHARLES.—"Certain improvements in reducing friction in wheels of carriages, which improvements are also applicable to bearings & journals of machinery."

According to one modification of this invention there are interposed between the axle and the interior of the axle box of a carriage a number of rollers, which may either be cylindrical, spherical, or conoidal in shape, and which, by their rotation serve to diminish the friction between the axle and the box. These rollers are placed at equal distances apart around the axle, and are kept in their relative positions by means of an instrument which is called "a cradle," and which consists of a cylindrical piece of metal which nearly fills the space between the axle and the inside of the box, and is provided with recesses in which the rollers work, the cradle being of such dimensions that the rollers project through it both on the side next the axle and also on the side next the box, a suitable cap or cover being applied if necessary at each end of the box to prevent the rollers from working or falling out of such box. In the case of a long axle the cradle may be adapted for the reception of several sets of rollers, placed in line with each other, and one modification of the invention is described in which the cradle consists of two plates or discs having in them suitably formed recesses, these recesses, when the plates are placed together, forming receptacles and guides for spherical rollers, this arrangement being more especially intended for

application to a crane. These rollers of whatever form, as well as the cradles, axle boxes, and any other parts which it may be desired to combine therewith, may be cast in metallic moulds, by which great hardness of the surfaces of the articles so cast will be obtained, or they may be formed in the ordinary manner. This invention may be applied to lessening the friction "in the boxes and axles of carriages, gun carriages, " turning plates of swing bridges, turning plates of railways, " and other mechanism."

[*Printed, 8d. Drawing.*]

A.D. 1840, February 5.—No. 8372.

MOAT, CROFTON WILLIAM.—Steam carriages. The carriage described in this Specification has four wheels, the machinery being carried on one pair, the passengers and baggage on the other. The two pairs are united by a perch working on a pin on the fore axletree bed and there is also a spring catch attached to the framing of the carriage which engages with the machinery part forward. The engines are suspended by straps from bearing springs and the wheels have also elastic spokes. The vehicle is steered by a shaft pulley, the ropes of which pass round the pulleys at the front axletree and at the perch.

A modification of this carriage is also shown. This is driven by two cylinders to each wheel. They are placed at right angles to each other, one horizontal the other vertical, and act on one crank. The crank axle is fitted with a toothed wheel which drives another on the nave of the wheel. Thus the wheels run independently. In this case also the fore and hind carriages are differently connected. To the fore carriage there is attached a segment piece, the centre of which corresponds with the middle of the fore axle. This segment piece is confined between rollers fitted to the hind carriage.

[*Printed, 2s. 2d. Drawings.*]

A.D. 1840, February 22.—No. 8392.

COOK, WILLIAM.—"Improvements in carriages."

This invention "relates to that description of carriages " wherein what are called German shutters are used to close

“ them,” and consists in “ a mode of constructing and applying certain apparatus to such carriages and German shutters to facilitate the working and moving of such shutters.”

An arrangement is set forth in which a German shutter, formed as usual of three glazed sashes, has the upper part hinged to a frame fixed in the head of the carriage, the middle part hinged to the upper part, and the lower part again hinged to the middle part, the arrangement being such that when the shutter is raised the middle part folds against the upper part, while the lower part folds under the middle part. Fixed to the upper part of the carriage frame is what the patentee calls a spring box this containing three springs coiled up in barrels which revolve on axes “ in like manner to clock springs.” Around each of these barrels is coiled a cord, one of which passes down to the lower portion of the shutter to which it is connected, the cords from the two other barrels being connected to the upper part of the shutter. The springs are so arranged that by the application of a key to their axes they may be wound up to the requisite extent. Connected with the lower part of the shutter are a strap and a tassel, and when it is desired to raise the shutter the strap is drawn inwards so as slightly to dislodge the shutter from its vertical position, when the springs in the barrel will at once act upon the latter, so as to cause them to revolve and raise the parts of the shutter, through the medium of the cords, into the requisite position. When it is desired to close the shutter, a person will take hold of the tassel with one hand and draw down the shutter for a short distance, completing the closing of the shutter by pulling at the strap with the other hand; certain hook-formed projections on the middle part of the shutter taking upon studs projecting from the side frame in which the shutter works, and acting as hinges upon which the lower parts of the shutter turn.

By a memorandum of alteration, filed on the 31st of March 1843, the patentee amended the title of this invention by adding to it certain words which converted the title into “ Improvements in carriages wherein German shutters are used, as to the mode of moving and working such German shutters.”

[*Printed, 1s. 3d. Drawings.*]



A.D. 1840, May 5.—No. 8495.

**HILLS, FRANK.**—Wheels, axles, and bearings of steam and other carriages. The improved wheel is made by welding wrought iron spokes to iron rings made slightly conical, while the spokes are dished in the opposite direction. Two such sets of rings and spokes are fitted in a flask and the nave cast on, after which the felloes of wood are inserted in the space between the rings, secured and tired. A second tire made up of segments may also, if required, be attached to the main tire.

The improved arrangement of axle consists of a stationary bent iron frame, in the centre of which are the cranks and driving shaft. This frame forms at each end the axle round which a wheel revolves. The driving shaft passes through these ends, and is connected with the wheels. A pair of clutches serves to unite the cranks and the driving shaft.

The patentee further describes a bearing for the purpose of providing increased lubrication. A collar is put round the shaft, which runs in a groove connected with oil cavities in the brass.

[*Printed, 1s. Drawings.*]

A.D. 1840, May 12.—No. 8504.

**DIRCKS, HENRY.**—Locomotives and wheels to be used on rail and other ways. The first part of this invention relates to a method of utilising the exhaust steam in the form of small jets, for the purpose of preventing the emission of smoke. The improvements in the construction of railway wheels “consist in forming the tyre of the wheel of cast or wrought iron, having a channel or groove formed in it to be filled with blocks of wood, having the grain of the wood placed vertically or endways all round in segments which are afterwards bolted or rivetted or otherwise fastened in the channel of the tyre, and present a wooden rim or running surface to the road or way.” The wood preferred for this purpose is “African oak, British oak, beech, or other hard wood, previously soaked or saturated with coal-gas tar, and impregnated therewith by means of hydraulic or other pressure, in order to fill up its pores, and thus prevent the admission of moisture,” but other woods, compressed or other-

“ wise suitably prepared, may be used. One mode of securing the segments of wood in the channel of the tyre is mentioned, in which a groove is formed, “ half in the metal and half in “ the wood,” melted metal being then run into this channel.

[*Printed, 9d. Drawings.*]

A.D. 1840, May 28.—No. 8521.

SMITH, WILLIAM HENRY.—Springs for carriages. The mode of applying springs to carriages consists in placing a helical spring between the bearing of each axle and the framing of the carriage, so as to stand “ obliquely ” between such framing and axle, this arrangement giving the springs a “ double ver- “ tical action, resisting a shock either from above or below,” and also causing them to offer some resistance to the shock of a collision between two carriages, one of them being then somewhat compressed, and the other extended. The details of the invention may be varied.

[*Printed, 10d. Drawings.*]

A.D. 1840, September 10.—No. 8626.

HOULDSWORTH, HENRY.—“ An improvement in carriages “ used for the conveyance of passengers on railways, and an “ improved seat applicable to such carriages, and to other “ purposes.”

The invention comprises two objects: “ 1st, to combine in “ some degree the pleasure of outside with the comfort of “ inside travelling; and 2nd, to economise the space occupied “ by seats where space is an object and to protect out-door “ seats from the weather.”

The first of these objects is accomplished by covering the carriages (which for this purpose are generally constructed without compartments) “ either wholly or in part with metallic “ wire gauze cloth or net of a texture sufficiently close to “ break the force of the wind and destroy the violence of the “ currents of air produced by rapid motion through it, and “ also to impede the entrance of the coke dust emitted by the “ locomotive chimney and yet not materially to obstruct the “ view of external objects. The second by the use of seats “ constructed to turn or fold up of themselves when not in “ use by the action of springs or weights.”

The details of the invention are described at some length and may be greatly varied. These include a complex arrangement consisting of a slide, curved and other arms, a tumbler, a spring, a joint piece, and other adjuncts for the purpose of retaining the seat in a horizontal position when turned down; and also a retarder," consisting of a piston working in a small cylinder filled with a fluid or with air which is for the purpose of preventing the seat from rising upwards with too great rapidity when released from the retainer. These details however may all be greatly modified.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1840, September 24.—No. 8639.

MAUGHAN, JOHN.—“Certain improvements in the construction of wheeled carriages.”

This invention consists “in the improved construction and mode of applying two pairs of shafts to that description of carriage generally denominated ‘curricule,’ which are to be employed as a substitution for the pole and cross bar commonly applied to a carriage of that description, by which improved mode of attaching two horses to a curricule much lighter construction of the vehicle is practicable, elegance of appearance increased, more freedom of action allowed the horses in their draught, and greater safety insured. The lightness is owing to the removal of all the heavy carriage framework necessary in the old construction; the shafts (which are high) connecting immediately by scroll irons to the foot board of the vehicle. Greater elegance of appearance is consequent upon the absence of the aforesaid cumbersome framework, and the usual pendant wooden support horse.” Other advantages are set forth as arising from the invention, it being mentioned in particular that greater safety arises “from the carriage having wide support in front, instead of the single centre bearing afforded by the pole of the old curricule, which wider support renders a vehicle of any construction less liable to upset. The equal division of the support of the front weight between four shafts offers, moreover, less risk of accident from breakage than when the weight is upon one pole only, and the danger from overbalancing backwards in ascending hills, or from other circumstances, is also effectually obviated.”

The mode in which the horses are to be "put to" the vehicle is specially set forth, a certain "loose iron" being employed in order to cause both pairs of shafts to rise from the ground together "and preserve their coincident level on lifting one of the pairs," such "loose iron" being carried, when not required for use, in the seat of the vehicle, "or stowed away in any other convenient place."

[Printed, 10d. *Drawing.*]

A.D. 1840, October 22.—No. 8667.

RIDDLE, GABRIEL, and PIPER, THOMAS.—"A certain improvement or improvements on wheels for carriages."

This is an extension of privilege for seven years, to be computed from the 11th day of October 1840, being the expiration of the first term of 14 years granted to Theodore Jones (A.D. 1826, No. 5415) and by him assigned to the above named Gabriel Riddle and Thomas Piper.

A.D. 1840, November 24.—No. 8712.

POPE, FRANCIS.—Detaching horses from carriages. Each shaft of the vehicle has at the end next thereto a pin, which, when the shafts are connected to the carriage, is secured by a bent lever or tongue moving on an axis between two "side plates" fixed in some convenient manner to the carriage, and which is turned over the pin, and retained in position by a catch, which consists of a small bar mounted on a fulcrum at its lower end, and furnished with a projection which bears upon the end of the bent lever or tongue, being pressed thereon by a spring. While the parts remain in this position the connection between the shafts and the carriage is maintained, but should it be desired to disengage the carriage from the shafts, as, for instance, in the case of the horse running away, the catch of each shaft is drawn into such a position as to release the bent lever or tongue, which then turns backwards and leaves the pin in the shaft at liberty. The catches are acted upon simultaneously by means of a vertical rod mounted in a tube in front of the carriage, which on being pressed downwards presses downwards also a bent bar which acts upon both catches, the bent bar passing through a forked part of the vertical rod, provided with anti-

friction rollers, so that the bar may move freely when the carriage is "on the lock," the vertical rod being also provided with springs and a shoulder, by which it is retained in position when not in use.

[*Printed, 1s. Drawings.*]

A.D. 1840, November 27.—No. 8727.

CONDIE, JOHN.—Springs. This invention relates to a mode of applying springs, or springs and levers, in such a manner as not only to give all the benefit and advantages of the usual system, but also to "effect the uniform continuity of the " pressure made to bear on the driving or other wheels of " locomotive and other carriages," and promote the constant adhesion of the driving or centre wheels to the rails or road. Different modes of carrying out the invention are described. In one arrangement an engine or carriage is mounted on six wheels, those in the middle being larger than the others, and the frame of the engine or carriage being provided with four points of support or suspension, these consisting of fulcra on which are placed levers, and such levers being united by links at one end to large bearing springs placed above the axle of the larger wheels, while at the other ends of the levers are vertical bearing rods, which descend to the bearings of the other wheels, the levers being, moreover, jointed together by horizontal connecting rods. Other modifications of the invention are described, in some cases only two bearing springs being used, while in others four are employed, in one arrangement the levers being dispensed with, and the springs being so arranged as to act directly upon the bearings of the axles. The invention is only applicable to engines and carriages " having six or more wheels."

[*Printed, 6d. Drawing.*]

A.D. 1840, December 28.—No. 8755.

BUCHANAN, JOHN.—Carriages, springs, &c. This invention relates firstly to an improvement in the arrangement of fore carriage and perch, whereby the carriage may be made shorter from axle to axle, and the front wheels may be of larger diameter than usual, without raising the body or hindering turning in a small space, while greater freedom of

action is given to the splinter bar and futchells. According to this arrangement the leverage of the pole or shafts while turning the under fore carriage with the front wheels acts through the upper fore carriage upon the body in such a manner as to cause the body and the fore carriage to move in contrary directions sideways then in effect moving the body out of the way of the front wheel on the inner side of the circle in which the carriage may be turning. Various modifications of the arrangement are shown.

The futchells and splinter bar, instead of being fixed rigidly to the fore axle, axle bed or spring base, are attached by joints so as to allow play with the motion of the horses thus diminishing strains and draught.

The invention also relates to a method of suspending carriages by means of cross springs, without side springs or connecting perch, in such a manner that the weight of the carriage is suspended below the axle.

It also includes an improvement in springs. They consist of two or more plates kept from contact with each other by a block or blocks between them in the middle of their lengths, and connected at the ends by links or shackles or rollers, or by the plates being differently curved and fastened at the ends.

Further, there is described a mode of applying braces to C springs. The brace is attached to the frame of the carriage behind the spring at such an angle as to support the spring "so as to obtain the necessary degree of what is commonly called draw, on the brace, without the aid of the heel flap or stay hitherto used for that purpose."

[*Printed, 11d. Drawing.*]

A.D. 1840, December 28.—No. 8756.

ADAMS, WILLIAM BRIDGES.—"Certain improvements in the construction of wheel carriages, and of certain appendages thereto."

The first part of this invention relates to what the patentee terms "the hind wheel lock." It consists in causing the hind pair of wheels and their axle to swivel by means of the leverage of the pole or shafts, by which turning is facilitated. The invention also includes a mode of constructing spring

wheels of the character of those for which a patent was granted to the present patentee on the 13th of March, 1835. The present improvement consisting "in altering the form of  
" the spring spokes from that of a perfect hoop of steel, or  
" other elastic material, to that of a portion of a hoop with  
" tangential lines, for the better securing them in the nave,  
" and also making all the spokes bear against each other  
" laterally, with or without the intervention of wood or  
" other substance, so as to afford mutual support to each  
" other, and render the wheel stronger, the periphery consisting either of a solid iron tire, or of two or more parts, or  
" of a combination of wood and iron."

Another improvement consists in the application to the axles and moving joints of wheel carriages, of elastic collars or washers formed of leather, or woollen or similar material, "armed with a surface of polished metal, so that the friction  
" is confined to the metallic surface, thus preserving the elastic  
" packing and preventing the loss of oil."

Another improvement relates to an arrangement of "spring  
" breaks," in which brakes are connected to bars and operated upon through the medium of springs passing round or connected with such bars, and certain levers also connected with such springs. "Self-acting" brakes are also described as being composed of brakes connected by wooden bars with the buffer bars, and sustained by "radius bars" jointed with the axle boxes, or by rods or cords connected to the carriage frame.

Another improvement consists in the employment of "drag  
" staves," which are formed in two parts, one capable of sliding within the other, and a spring or springs being connected with them, and the lower end of the drag staff being furnished with a spike. The patentee mentions that such a drag staff would be a security to railway carriages when ascending inclines, "enabling the engine to rest and accumulate power," and aiding it in starting again the train, the spiked ends of the drag staves preventing the train from running backwards, and the springs becoming compressed by the pressure of the carriages against them.

Another part of the invention relates to the axles of carriages which are moved by "self-contained power," radius bars or frames regulating the axles so as to keep the wheels parallel with the line of progress, and such bars or frames

“ sustaining the alternate thrust and pull of the moving  
 “ power through the agency of bands or toothed wheels to  
 “ multiply the speed without interfering with the free action  
 “ of the bearing springs,” which the ordinary axle guides are  
 found to do, and such radius bars being applicable to railway  
 carriages generally as a substitute for such guides.

The invention further includes the application of shifting  
 fulcrum springs, combined with radius bars, as bearing  
 springs, and also as buffer springs, also certain modes of sus-  
 pending carriage frames on bow springs, in one of which the  
 loops or brackets are “ within the lengths of the springs,”  
 space being thus economised, while in another mode the curve  
 of the spring is reversed, the effect of which is that on the  
 coupling or “ robbin ” breaking, the point of the spring would  
 rest within the hollow of the bracket or loop, and sustain the  
 weight of the carriage. Shackle braces are also described as  
 being formed of “ fibrous yarn or metallic wire in a con-  
 “ tinuous skein,” “ bonded together by adhesive waterproof  
 “ materials.”

[*Printed, 1s. Drawing.*]

A.D. 1841, January 28.—No. 8819.

GALL, WILLIAM.—“ Certain improvements in the construction  
 “ of locomotive engines, and of the carriages used on rail-  
 “ ways, applicable in part to carriages used on common  
 “ roads.”

[*No Specification enrolled.*]

A.D. 1841, February 15.—No. 8846.

PHILLIPS, PHILIP WILLIAM, and PECK, WILLIAM BISHOP.—  
 “ Improvements in four-wheeled carriages.”

This invention relates to such four-wheeled carriages as  
 have two bodies capable of independent motion, and the im-  
 provements have for their object “ better means of connecting  
 “ two separate bodies, in constructing a four-wheeled carriage,  
 “ by which the locking action and general character of such  
 “ description of four-wheeled carriages will be improved.”

Different modes of carrying out the invention are described,  
 in one arrangement a vehicle consisting of a fore and hind  
 body, each having its own pair of wheels, the two being



connected by a locking apparatus composed of a circular hoop or plate affixed to the hind body of the carriage, and embraced by a hoop or strap, these parts being combined with certain rings and plates, a short pole, and other minor details, the parts being capable of separation, however, in such manner that the fore part of the vehicle may be used as a gig. In another arrangement a certain grooved plate and bar are substituted for the circular hoop or plate mentioned above. In another arrangement bent or curved bars work in curved grooves connected with both the fore and hind parts of the vehicle, in all these cases the details of the arrangements being capable of variation, so as to adapt the vehicle for being drawn by either one horse, or more than one, as may be desired.

[*Printed, 10d. Drawing.*]

A.D. 1841, March 8.—No. 8867.

**VARLEY, JOHN.**—"An improvement in carriages."

This invention "may be described generally as consisting in the application of an additional pair of wheels to ordinary two-wheeled vehicles as at present constructed; of an additional pair of hind wheels to ordinary four-wheeled vehicles, either with or without an additional pair of front wheels; the additional wheels, both hind and front, of all vehicles, and the pair of front wheels of the ordinary four-wheeled vehicles, being in all cases arranged and placed in a peculiar manner." "These additional wheels furnish additional supports for the weight or load, and by reason of the subdivision and distribution which may thus be made of the weight or load the individual or separate springs of the carriages may be made much lighter than they could otherwise be." The patentee mentions that carriages thus constructed "will travel across the obstacles or inequalities of the road more easily and with less jolting than is usually experienced."

The invention is set forth at some length, and as applied to vehicles of various kinds. The "essential part" of the invention, however, is mentioned as consisting in "the application to carriages of wheels placed parallel and contiguous to each other, whereof one is in advance of or overlapping the

“ wheel contiguous to it.” The details of the invention embrace certain arrangements of the springs, axles, locking apparatus, and other parts of the vehicles, which will only be understood with the aid of the drawing annexed to the specification.

[*Printed, 1s. 2d. Drawing.*]

A.D. 1841, March 22.—No. 8899.

WRIGHT, JOSEPH.—“Improvements in apparatus used for “dragging or skidding wheels of wheeled carriages.”

This invention relates to “a mode of applying apparatus to the skid pans of wheeled carriages, whereby a skid pan can be placed under a wheel in order to skid or drag it, and when desired the skid pan is removed by allowing the wheel to pass over it by releasing the drag chain.”

An arrangement is described in which a skid pan is connected by means of a link to a rod or lever, the axis of which is carried by apparatus attached to the hind axle of the vehicle. In combination with this apparatus (which consists essentially of what the patentee terms a “quadrant frame”) are certain levers, springs, guides, bars, chains, cords, and other mechanism, the operation of which will only be understood with the aid of the drawings annexed to the Specification, a rod with a handle thereto enabling the driver of the vehicle to bring the skid into action and again cause its action to cease as may be requisite.

The details of the invention may be varied, the patentee stating that he claims as of his invention the mode of applying skidding or dragging apparatus to wheels of wheeled carriages, “whereby in unskidding the same the skid pans are allowed to pass under the wheels by releasing the drag chain.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1841, March 22.—No. 8900.

WRIGHT, THOMAS.—Skids, wheels, shafts, &c. This invention relates firstly to a method of skidding the wheels of railway and other carriages. For common road purposes, the skid is shown attached to the end of a curved bar or rod sliding in a groove formed at the hinder part of the splash board, or it may be fixed to a moveable splash board. It is

lowered under the wheel by means of a hand lever cranked to a rod which is jointed to the curved rod. This lever is under the control of the driver or other person in the carriage.

It also relates to a method of securing wheels on the axles, by means of sliding pieces passing through slots in the wheel nave and held therein by screws. A spiral groove is cut round the axle for the purpose of facilitating distribution of the lubricants which it extracts from an oil box.

Springs are made by the patentee of plates each of which is curved differently from its neighbour. Consequently the strain in the spring is gradually diffused over the whole, each plate taking it up in turn.

Shafts and spokes are to be made of tubular steel, and the latter may be filled with cotton, sawdust, or like substance.

[*Printed, 10d. Drawing.*]

A.D. 1841, March 31, No. 8911.

GAURY, JOSEPH.—(*A communication.*)—"A parachute to preserve all sorts of carriages from falling, or injury upon the breaking of their axletrees."

This invention consists in "fixing an apparatus, which is denominated a parachute, to the nave of all sorts of carriage wheels, so that the carriage may be preserved from falling and injury, and continue to run in the event of the axletree or axletrees breaking," the essence of the invention being "to provide a secondary or temporary support to the nave of the wheel."

One arrangement is set forth in which a collar is formed or placed on the axletree, a grooved ferrule fitting into the inside of such collar, certain jointed semicircular caps, which fall into the groove of the ferrule, and certain "separating bars" forming parts of this portion of the invention. In another arrangement a ferrule made in two parts is placed upon the axle, collars or separating bars entering between the parts of this ferrule. And in another arrangement a washer carried by a forked arm is placed within a groove in the axle box.

[*Printed, 8d. Drawing.*]

A.D. 1841, June 28.—No. 9011.

KNIGHT, WILLIAM. — “An indicator for registering the number of passengers using an omnibus or other passenger vehicle.”

This invention consists “in the combination of a counting apparatus with an apparatus having two pairs of arms or levers sliding at right angles to each other through a shaft placed across the upper part of the doorway of an omnibus or other the like passenger vehicle; one pair of arms when at rest lying horizontally under the roof, and the other pair of arms hanging down against the doorway to form an obstruction, which must be removed out of the way by the passenger on entering and on leaving the vehicle.”

The invention is set forth at some length, and includes the employment of certain clicks, ratchet and other wheels, springs, detents, and other mechanism, through the medium of which rotation is given to certain cylinders, marked with figures on their circumferences, such figures indicating the number of passengers who have entered or left the vehicle, the apparatus however being so contrived, as to act “either on the passengers entering or on leaving the vehicle, but not both on entering and on leaving.”

The details of the invention will only be understood with the aid of the drawings annexed to the specification.

By a disclaimer and memorandum of alteration enrolled on the 27th of May, 1842, the patentee made various changes in the [wording of the specification of this invention, stating in particular that he did not intend “to register the outside passengers who may be said to use an omnibus,” and also that there were several kinds of “passenger” vehicles to which he did not intend to apply his invention.

[*Printed, 1s. Drawings.*]

A.D. 1841, July 2.—No. 9015.

PHIPPS, GEORGE HENRY. — Wheels. The object of this invention “is to do away with the necessity for ‘shrinking ‘on’ hot the tires of such wheels, whereby the strength of the iron is often so much diminished by the force of contraction, as to cause it to fly or give way when sub-

“ jected to very slight strains or concussions.” The tyre is formed by rolling or forging in the usual manner, and is furnished with an inner rib. The spokes are of wrought iron, and a double set of spokes being placed in position a nave or boss is cast upon their inner ends, and the outer ends, which are enlarged and furnished with bolt or rivet holes, are then rivetted or bolted to the inner rib of the tyre, one set of spokes being on each side thereof. The particular positions of the spokes in relation to each other may be varied.

[*Printed, 10d. Drawing.*]

A.D. 1841, July 7.—No. 9020.

FULLER, THOMAS.—“ Certain improvements in retarding the progress of carriages under certain circumstances.”

In the first part of this invention a drag is applied to a carriage, but not in such a manner as to be applied to either of the wheels, having no connection whatever with them. The drag, shoe, or skid, is connected by joints to pendant levers, the latter being also jointed to bars which are attached by means of clips to the hind axletree of the vehicle, various other levers, rods, and other mechanism being combined therewith, the result of the arrangement being that on the driver of the vehicle releasing a ring or hook attached to a certain cord or strap from a stud or pin on which it rests when the drag is not required to act the latter falls to the ground, the levers then assuming a position which causes the skid to act “ as a crutch to the axletree,” raising one end of it until the wheel at that end is lifted off the ground, a portion of the weight of the carriage now resting upon the skid, the friction of which upon the ground retards the movement of the vehicle, the action of the skid being caused to cease when desired by slaekening the ordinary drag chain, the skid then passing backwards, and, by a circular movement of some of the parts in connection therewith, being brought back into its original position. These arrangements may be modified, and the skid made, if desirable, to act upon one of the wheels of the vehicle, instead of operating as mentioned above.

[*Printed, 7d. Drawing.*]

A.D. 1841, August 21.—No. 9052.

DE BERGUE, CHARLES.—(*A communication.*)—"An improvement in axletrees and axletree boxes."

According to this invention there are placed on the inner part of the arm of an axletree two shoulders or collars, between which a "divided nut" formed of any suitable metal, is placed, the exterior of this nut being furnished with a screw thread for the reception of a corresponding thread formed in the inside of the inner end of the axletree box, so that when the two parts of the divided nut are placed together on the axle between the shoulders or collars thereon, and the box "screwed home," the parts are held in their proper positions, "and the nut and box or bush," forming as it were a single body, revolve freely on the axle, this arrangement effectually preventing the wheel from leaving the axle when working. The screw of the divided nut "is cut in the opposite direction to that in which the box is designed to turn, so that the subsequent rotation has a tendency to tighten the "screwed part and keep the nut firm in its place when "moving," the escape of the oil or other lubricating material applied to the axle being prevented by a small collar of sponge or other material which is let into a groove formed in one of the shoulders or collars mentioned above. A small case or chamber is screwed to the end of the axletree box for the purpose of holding a supply of lubricating material, a recess being made in the axle itself for the reception of oil, as well as a corresponding recess in the box. These arrangements admit of the ready removal and replacing of the wheels from the axles, for the purpose of cleansing the boxes or otherwise.

[*Printed, 5d. Drawing.*]

A.D. 1841, September 20.—No. 9086.

SHILLIBEER, GEORGE.—"Improvements in the construction of hearses, mourning, and other carriages."

This invention consists in the first place in "the combination of a vehicle or hearse for conveying dead bodies to the place of interment with a vehicle or carriage for conveying the mourners attending a funeral and so as to form one "vehicle or carriage," the inventor stating that by means of

his arrangement "a dead body, together with the mourners, may all be conveyed to the place of interment in one vehicle or carriage, and therefore at a much smaller cost than is usually paid for a hearse and mourning coach when used (as hitherto) as separate carriages."

An arrangement is set forth in which a vehicle is so constructed that the back portion forms a carriage for mourners, furnished with a suitable door, seats, and windows. The front portion of the vehicle forms the hearse, and is constructed in parts so arranged that by the turning of a screw it can be lengthened or shortened and thereby adapted for the reception of coffins of different lengths, this part of the vehicle being provided with suitable seats on the exterior, and doors by which access is obtained to the interior, other minor conveniences being provided for facilitating the working of the apparatus.

Another part of the invention relates to a brake or drag which is applicable to carriages in general, the pole of the vehicle being so arranged in combination with certain levers and other apparatus that the "bearing back" of the horses in descending a hill or otherwise causes certain iron curbs lined with wood to be pressed against the front wheels of such vehicle, thereby controlling its motion.

[*Printed, 10d. Drawing.*]

A.D. 1841, October 7.—No. 9113.

DAVIS, MARCUS.—Distance meter.—The invention is thus described by the patentee:—

It "consists in the construction and adaptation of a certain apparatus which may with facility be applied to and removed from the wheels of different carriages without reference to the size of the wheels." The apparatus "consists of a small roller placed on the top of one of the running wheels, and maintained in contact therewith by springs or other convenient means, whereby the rotary motion of the running wheel is communicated to the small roller revolving in contact with it, and by means of the shaft or axle on which this small roller is mounted, motion is given to certain wheel-work placed inside the carriage, or in any other convenient situation, whereby the number of times the small roller revolves, and consequently the distance travelled,

“ is accurately marked and indicated by an index on a plate  
 “ or dial connected to the apparatus for that purpose.”  
 For carriages let on hire it is advisable to have an index  
 “ that cannot be readily altered, and that answers only to  
 “ the movements of the vehicle. To effect this I construct  
 “ the apparatus in the following manner :—“ Instead of the  
 “ index I mount a circular dial plate on the same centre, and  
 “ cause it to revolve, instead of the index ; then I cover the  
 “ revolving dial plate with another circular plate, but fixed,  
 “ and having a small opening made in one part of it for the  
 “ purpose of showing the figures on the dial plate as it  
 “ rotates ; or the dial plate may be fixed and divided into any  
 “ required number of equal divisions, and a circular plate  
 “ with a slot or opening made on it to correspond with the  
 “ figures on the dial plate, is connected to the internal  
 “ mechanism, and caused to revolve thereby showing through  
 “ the slot or opening the distance travelled. This plate may  
 “ be covered with a piece of strong plate glass. . . . If re-  
 “ quired, the striking and repeating movements of a clock  
 “ may be adapted to the apparatus. . . . By this means the  
 “ apparatus may be made to strike at the end of every mile,  
 “ half mile, or quarter, and also by applying a repeating  
 “ movement, it may, upon pulling a cord, be made to strike  
 “ the number of miles travelled.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1841, November 9.—No. 9143.

DAVIES, HENRY.—Propelling carriages, &c. The first part of this invention relates to a method of towing boats on canals. For this purpose a carriage runs on the towing path and is connected with the boat by an endless rope. This rope is worked by power in the boat and passing round a pulley on the carriage communicates motion by bevel gearing to its wheels. Thus the carriage is propelled and in progressing tows after it the boat. The front of the carriage is fitted with a steering wheel.

Another part of the invention consists in supporting carriages upon legs or supports instead of upon wheels. These legs are moved, either by the animal drawing the carriage or by machinery borne by it, through the medium of cranks joined



to levers. For steering purposes the legs are made to vibrate at an angle to the length of the carriage frame. The legs are connected by ball and socket joints with the carriage.

[Printed, 2s. Drawings.]

A.D. 1841, December 21.—No. 9205.

BOUVEIRON, HENRI ALPHONSE BOUNEVIALLE.—(*A communication.*)—"Improvements in axletrees."

This invention relates to the axletrees of carriages suitable for ordinary roads, and also to carriages for railways.

Each wheel of the vehicle has a separate axletree; the inner portion of each axle, however, extending almost across the framing. The inner end of each axle is in the form of a pulley with flat bottom, and has two rings which are placed between the two grooves of a cross piece attached to the framing, the axle gradually increasing in thickness from this part until it arrives within a short distance of the wheel, when it is cylindrical for a short length, then conical for a certain distance, and then square in section, although tapering towards the end, which is formed into a screw for the reception of a nut by which the wheel is held in its place, the wheel being fitted upon this square part of the axle, and a linch pin preventing the nut from becoming unscrewed. The conical part of the axle passes beneath a small wheel which is mounted upon an axle carried by a "wheel bearer," this small wheel serving in fact as an antifriction wheel beneath which the axle turns, and the wheel bearer being furnished with a reservoir for oil, which by means of a tube and a wick of cotton, is made to pass to the axis of the small wheel for the purpose of lubrication. The upper part of the wheel bearer is of hardened steel, and adjusted on slides in upright supports. A certain "forked piece" is connected with a frame on which one of the springs of the vehicle is placed, this forked piece partially embracing the cylindrical part of the axle and keeping it constantly under the centre of the small wheel, the frame which carries the forked piece being connected with the wheel bearer, and suitable apparatus being arranged for lubricating that part of the axle which works in contact with the small wheel. The frame itself is of hard wood, covered on its two surfaces by a sheet of iron, and the carriage spring is fixed upon a cross piece at the end of the frame. The axles

of the carriage wheels are not placed horizontally, being higher at the inner ends than at the parts on which the wheels are fixed, thus causing the latter to assume a position somewhat out of the perpendicular.

Although this invention is mentioned as being applicable to railway carriages, no adaptation of it thereto is set forth.

[*Printed, 6d. Drawing.*]

A.D. 1842, March 4.—No. 9274.

SLAUGHTER, EDWARD.—Wheels.—This invention consists in forming a wheel, suitable for use either on railways or common roads, “with an outer ring having a dovetailed groove or recess, and spokes having a corresponding projection;” or “vice versâ, with spokes having a dovetail groove or recess, and an outer tyre having a projecting corresponding dovetail, so that the wheel shall be held together by means of dovetails to the spokes and rings.” The spokes may be of various forms, but an arrangement is described in which they are each bent into a figure somewhat resembling that of a heart, the broader ends being, however, made to correspond with the inner curve of the tyre, and the smaller and inner ends being united by a nave of metal cast upon them. The dovetail grooves or projections may be formed by any suitable means.

[*Printed, 5d. Drawing.*]

A.D. 1842, March 21.—No. 9298.

JESSOP, SYDNEY.—“An improved mode of preparing wrought iron intended for wheel tires,” &c.

This invention consists in the preparing of such wrought iron as is intended for wheel rims, wheel tires, rails, tram plates, switches, and such other like articles, having a wearing surface or wearing surfaces exposed to more friction than their other surfaces, by placing them in a carbonizing furnace in such manner as to expose what are intended to be their wearing surfaces only, to the process of carbonization, and protecting their other surfaces therefrom by suitable arrangements of position and fuel, and afterwards rolling, hammering, swaging, or otherwise consolidating the metal on such

surfaces, so as to make it hard, compact, and even all over. An arrangement is shown in which flanged bars suitable for the rims of railway wheels are laid in pairs, in such manner that the parts intended for the wearing surfaces only are exposed to the action of charcoal or some other carbonizing fuel; while in another arrangement, rims already brought into a circular form are laid one upon another, the fuel only acting upon the outsides of such rims.

[*Printed, 1s. Drawings.*]

A.D. 1842, April 26.—No. 9332.

PALMER, HENRY ROBINSON.—“ An improvement or improvements in the construction of roofs and other parts of buildings, and also for the application of corrugated plates or sheets of metal to certain purposes for which such sheets or plates have not heretofore been used.” One part of this invention consists in the application of corrugated plates or sheets of metal “ to railway and other wheels in place of the spokes or arms.” The rims and naves may be cast upon plates which have been previously prepared, and tires may be added thereto in the usual way.

The other parts of the invention contain nothing which requires notice here.

[*Printed, 1s. 11d. Drawings.*]

A.D. 1842, April 28.—No. 9334.

PAPE, JOHN HENRY.—Carriages and wheels. These improvements are applicable both to railway carriages and to carriages for common roads. According to the first part of the invention wheels are placed upon an axle which revolves within a tube, the latter containing inside each end brasses by which the axle is supported, and such brasses being kept in their places by means of boxes; one part of each box being fixed to the tube by means of screws, and being lined with a piece of leather to keep it grease-tight, while the other part of the box fits loosely upon the nave of the wheel next to it, “ thus serving to keep the wheel in its place in case of the fracture of the axis,” certain screws passing through the box and projecting into a groove in the nave, and certain hooks connected with the spokes of the wheel passing behind a

projecting portion of the box. The tube is also furnished with internal rings, which aid in sustaining the axle, and a shoulder near each end of the latter is provided with a scoop which at each revolution of the axle takes up a portion of grease (which is run into the tube), and conveys it to the brasses. This contrivance is meant for use chiefly in cases in which the bearings of the axles are inside the wheels, when such bearings are outside such wheels, the hooks and the screws which pass into the nave of the wheel may be dispensed with. A modification is described as being applicable to carriages for common roads in which the axle inside the tube is in two parts instead of being all in one piece.

Another part of the invention consists in a mode of stopping carriages by means of a screw which is placed in a vertical position above the axle, and so arranged that upon being slightly turned it will force certain brasses against the axle. This screw is, according to one arrangement, furnished with an arm or lever which is attached to one end of a flat spring, this spring, when at liberty, keeping the screw in such a position that the brasses are kept in contact with the axle, but the spring being also connected with the draw-hook of the carriage, so that the brasses are removed from the axle when that hook is acted upon in pulling the carriage forward, but are pressed into contact with the axle "the moment the " moving power ceases." Instead of a flat spring, a spiral spring, coiled round the axis of the screw, may be used. In the case of a carriage for common roads, arrangements must be made for releasing the spring and allowing it to act upon the axle by means of a pedal at the command of the driver.

Another part of the invention consists of a wheel, the spokes of which are composed of tubes, within which are inserted spiral springs or coiled springs, fixed to iron branches, which are connected to the rim of the wheel, and terminate in iron rods, being so arranged that the ends of such rods rest upon the spiral springs, the wheel thus being rendered elastic. Outside the rim of the wheel is a layer of felt, "or other " yielding substance," and outside that again a tyre of iron, or other suitable substance. This part of the invention is minutely set forth, and a mode of bending wood when wood is used for the rim or felloe of the wheel, is described as consisting in driving " taper oval piers " of hard wood dipped in

asphaltum, into "circular holes" bored in the wood; steam or dry heat, however, being used if desirable. Another part of the invention relates to springs for carriages. A semi-circular spring is attached at the lower end to the axle box or some other suitable part, and terminates at the other and upper end in a coil with the centre of which is connected a link, which is also connected with the body of the carriage by a certain "centre." Around this centre a strap passes, which strap is also passed around the semicircular spring, and the result of this arrangement is that as the load borne by the carriage increases, the strap causes the spring to bear in succession, through the medium of rods, upon spiral springs placed in tubes, these being connected with the inner parts of the spring. Different modifications of this part of the invention are described, in some cases the spring consisting of several thicknesses of steel, and the strap being variously arranged according to circumstances, and in other cases these coiled springs and straps being combined with the ordinary flat springs. Another part of the invention relates to the construction of a carriage, of which the body is placed very low, and rests only on two large wheels, there being behind or underneath, the carriage a small wheel "after the fashion of a castor for the purpose of maintaining the equilibrium." The axle is cranked, the springs placed under the body of the carriage, crossing each other diagonally, being of considerable length and flexibility. Framework for a carriage is also described as being composed of metal tubes, combined with spiral springs, "which may be used in a variety of ways." The details of the invention are set forth at some length, and under various modifications. The door of the carriage mentioned above is placed at the back, and the small wheel is mounted in bearings connected with a vertical rod working in a tube in which is a spiral spring, the diagonal springs being, if desirable, combined with coiled springs.

[*Printed, 10d. Drawing.*]

A.D. 1842, May 23.—No. 9352.

GIBSON, JOSEPH.—"Certain improvements in axletrees and "axletree boxes."

This invention relates to an improved construction of axletree and axletree box, "whereby the lateral or end motion of

“ the latter on the former may be prevented ; ” the invention including a mode of lubricating the parts and of fastening the axletree box on the axletree. In the first place a collar is screwed upon the coned part of the axletree, by altering the position of which a second collar, upon which the axletree box is screwed, is pressed more or less forcibly against a shoulder formed upon the axletree. The end of the box is closed by a cap, screwed thereto, and there is a recess formed in the arm of the axle and also a longitudinal groove in the upper side of the arm, an opening in the collar communicating with this groove and serving for the admission of oil, which passes thence for the lubrication of the different parts. The first collar is prevented from coming unscrewed by means of a pin which is inserted into one or other of certain holes made therein, the inner end of such pin entering the groove in the axle arm, and leather washers are placed between the first and second collars and between the second collar and the shoulder on the axle, a bolt passing through the flange of the second collar and entering a recess in the end of the axletree box preventing the latter from becoming unscrewed from that collar. These arrangements are set forth at some length. The bolt last mentioned is of inclined form at the end, and the bottom of the recess is inclined also, this arrangement allowing the bolt to be pushed backwards at each rotation of the box when being screwed up, the bolt being constantly pressed in one direction by springs. An instrument is contrived for holding the bolt out of the recess when it is necessary to unscrew the parts.

[*Printed, 7d. Drawing.*]

A.D. 1842, July 23.—No. 9427.

JOHNSTON, ALEXANDER.—“ Certain improvements in carriages, which may also be applied to ships, boats and other purposes where locomotion is required.”

This invention consists “ in the application of guide wheels or rollers to railway and other carriages, attached to the sides of each carriage and placed so as to act against the side or edge of the rails, in order to prevent or diminish the friction and consequent loss of the moving power, stripping or injuring the rails, and other disadvantages arising from the flanges rubbing on the rails.” The rollers

may be inserted and held in forks "formed in the ends of " stays arranged to receive them" and "be made to turn on " a pin or axle." "These rollers being intended to supersede " or form a substitute for flanges, may also be placed some- " what nearer to the rails than the medium distance of the " ordinary flanges as at present in use, but so as to allow " sufficient play to the carriage," such rollers being placed in an inclined position, "similar to the base of a cone," thus presenting "a vertical surface to the rail." Different modifications of the invention are described, and the invention may be "applied to carts and other vehicles, to adapt them for " being used also on railways wholly or partially laid on " common roads," the details of the invention being capable of many variations. By a disclaimer and memorandum of alteration which was enrolled 'on the 23rd of January, 1843, the patentee renounced all claim to this invention as "applied " to ships, boats, and other purposes where locomotion is " required."

[*Printed, 4d. No Drawings.*]

A.D. 1842, August 3.—No. 9437.

LEE, JOHN.—"Certain improvements in wheels and axletrees " to be used on railways, and in machinery for stopping on " or preventing such carriages from running off railways, " which improvements may be also applied to other carriages " and machinery."

This invention is described at considerable length, and embraces a variety of details, which will only be understood with the aid of the drawings annexed to the Specification. The first part of the invention relates to improved axles, " which are distinguished into three parts; first, the ordinary " axle divided into two parts," which are joined together by coupling collars; secondly, "auxiliary axles" composed of bars of metal connected with curved plates placed on the nave of the wheel, these "auxiliary axles" being for the purpose of serving as supports in case of the other axles breaking; and thirdly, certain bearing collars, which in combination with the curved plates and certain other appendages, secure the auxiliary axles to the naves of the wheels. The next part of the invention relates to improved naves for wheels, "which

“ are distinguished in three particulars from ordinary naves ;  
“ first, by increased length ; second, by being grooved for  
“ collars for the axles ; and, third, by being grooved for  
“ collars for the brakes ;” the latter being supported by the  
naves, and connected with arrangements of levers which may  
be operated by various different means, and the brakes being so  
formed that when brought into action they press not only  
against the carriage wheels, but upon the rails also. These  
levers are either operated upon by the buffers of a carriage, in  
case of collision, through the medium of a spring, a “ brake  
“ bar,” and other adjuncts ; or by means of a windlass or  
wheel, having handles on its periphery, and a female screw in  
its centre, through which a screwed shaft passes, the windlass  
being turned by the guard, or by means of a pipe passing  
from the engine, and supplying steam to a plug or piston when  
requisite.

The invention includes a mode of limbering up gun carriages, including the application of the above axles to such carriages and a method of lubricating and constructing the naves of the wheels. The patentee states that he claims his improved axles and naves not only as applied to carriages, but to “ wheelwork in machinery.”

[*Printed, 2s. 10d. Drawings.*]

A.D. 1842, August 31.—No. 9456.

THATCHER, CHARLES, and THATCHER, THOMAS.—“ Improvements in drags or breaks to be applied to the wheels  
“ of carriages generally.”

This invention relates to arrangements so contrived “ that  
“ the horse may, by its own natural effort in the act of holding back, bring the break into action ; and the attendant  
“ may either assist in producing the same effect or produce  
“ it independently of the action of the horse.” The invention consists “ in having certain levers and parts connected  
“ therewith so arranged that one end of the system of the  
“ levers shall be in connection with parts of the harness, and  
“ with an arm convenient of access for the hand or foot of the  
“ attendant, and the other end caused to bear against the  
“ periphery of the stock of the wheel.”

An arrangement is described in which an ordinary chaise axle has affixed to it, inside the wheels, castings carrying pins



which each form the fulcrum of a lever, these levers extending across the axle, and crossing each other, each lever being of T-shape at the end next the wheel, and being curved or hollowed on the face of that part for the purpose of causing friction when brought into contact with a hoop on the stock of the wheel. With the other end of each lever a pulley is connected, and round these pulleys a chain or rope is passed which is connected with the shafts of the chaise and also with that part of the harness called the breeching, the result of the arrangement being that when descending a hill the pressure of the vehicle against the horse, by causing him instinctively to resist such pressure by acting against the breeching, brings the brake levers into action. In order that the driver may have the control of the brakes, and also relieve the pressure from the horse, a certain hooked piece is passed over the brake levers and connected with a lever which may be acted upon by the foot of the driver. A handle and lever, the latter carrying a hook over which the rope or chain is passed is also arranged so as to relieve the horse when necessary from the pressure of the breeching. An arrangement is also described in which an ordinary coach pole has at the outer end a casting furnished with pulleys over which chains or ropes are passed, which are attached to the horses' collars and also to a chain extending along the under side of the pole, and connected with the chain or cord passing round the pulleys on the brake levers as before, the result produced being the same. In this case the coachman has the control of the brakes given to him by means of a bell-crank lever attached to the boot, and having connected thereto a cord or chain which is also attached to a ring so arranged as to act upon the chain or cord which brings the brakes into action when the bell-crank lever is acted upon by pressure of the coachman's foot.

[*Printed, 9d. Drawing.*]

A.D. 1842, September 3.—No. 9457.

HAZARD, ROBERT.—“Improvements in ventilating carriages, “and cabins of steamboats.”

The object of this invention is to remove the vitiated air from within a carriage by means of a “fanner” or ventilator which is put in motion by the revolution of one of the wheels of the carriage, or by some other motive power; “thus the

“ inmates, however numerous, may ride any length of time  
“ with the windows closed, excluding damp or dust, and yet  
“ enjoy perfect ventilation.”

An arrangement is described in which a chamber is formed in the top of a carriage which communicates with a passage proceeding down the back of the carriage, this leading to a fan or ventilator working in a suitable case, and driven by a strap passing from a small pulley on the axis of the fan to a larger pulley connected to one of the hind wheels. A flexible tube is placed between the case of the fan and the lower end of the passage formed at the back of the carriage, this being apparently for the purpose of allowing the apparatus to accommodate itself to the movement of the carriage on its springs. An opening is formed in the front part of the carriage for the admission of fresh air, and this opening may be provided with a sliding plate having openings therein, by which the quantity of air to be admitted may be regulated, a similar plate with openings being placed across the aperture by which the vitiated air enters the chamber in the top of the carriage. The form of the fan may be varied.

[*Printed, 6d. Drawing.*]

A.D. 1842, September 8.—No. 9459.

WARBURTON, WILLIAM.—“ Improvements in the construction of carriages, and apparatus for retarding the progress  
“ of the same.”

This invention consists in the first place in so arranging the parts of an omnibus that certain parts or compartments of the vehicle may be shut off from the rest and rendered private when requisite. An arrangement is described in which the body of an omnibus is divided into three main compartments. The hinder compartment differs little from the interior of an ordinary omnibus, having a door at the back, four seats on each side, and one seat at the front end. The middle compartment is meant to hold four persons, and is divided into two parts by a fixed transverse partition, and these may be again divided by sliding longitudinal partitions, to be locked or fastened by the conductor, when desired, thereby forming four distinct private boxes, each capable of holding one person, and having a separate door at the outside. The front

compartment, which is partially open, is formed like the body of a cabriolet, and with inclined flap doors, if required, the driver sitting upon a seat above contiguous with the roof. The fittings and furniture of the vehicle may be arranged according to taste, and flexible pipes, connected with a main pipe, are arranged so as to enable the passengers to communicate with the conductor. The middle and hind compartments are ventilated by means of narrow longitudinal openings, covered with wire gauze, perforated zinc, horse-hair cloth, or other suitable material. Another arrangement is described in which there is no private compartment, the cabriolet part being retained, and a saloon or hinder part being arranged in which the seats are divided from each other by wicker or cane work. The doors to the saloon are just behind the fore wheels. In both these arrangements the fore wheels are made larger than usual, the framing of the fore part of the vehicle being so arranged as to allow of such wheels locking, and being strengthened by iron plates.

Another part of the invention relates to retarding the progress of carriages when going down hills, and consists in attaching a block of wood to the back of one of the splash boards or wings of a carriage, the iron framing of this splash board being jointed, and its upper end connected to a horizontal rod which may be operated upon by a hand lever so as to cause the wooden block to be pressed against one of the hind wheels of the carriage when necessary.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1842, September 16.—No. 9473.

JAMES, WILLIAM HENRY.—“Certain improvements in rail-ways and carriage ways, railway and other carriages, and in the modes of propelling the said carriages, parts of which improvements are applicable to the reduction of friction in other machines.”

One part of this invention relates to the construction of carriages suitable for travelling upon certain elevated lines of railway. The framework of these carriages is so formed as to hang down below the surface of the railway on each side of the latter (the body of the carriage, however, being above the rails) and the carriages being mounted upon either wheels or rollers, in some cases such rollers extending nearly the whole breadth of the carriage, while in others three broad rollers are

mounted on one axle. The carriages are also provided with flanged rollers placed upon vertical spindles, these rollers bearing against side rails or projections formed on each side of the railway, and so preventing the carriages from leaving the rails, the projecting framing also tending to prevent such an accident.

Another part of the invention consists in adapting to the axles of the carriages certain wheels which the patentee calls "relief wheels," as they tend to lessen the friction of the axles. This part of the invention consists in reality in mounting the body of the carriage upon the axles through the medium of wheels suitably arranged upon short axes carried by the framing, and furnished with internal rings which rest upon small double-flanged wheels fixed on the ends of the axles, the relief wheels thus revolving by contact with the small wheels on the axles. These relief wheels may be applied not only to carriages such as mentioned above, but also to other carriages. This part of the invention may be applied not only to carriages such as mentioned above, but also to other carriages. This part of the invention may be varied by mounting relief wheels in framing of the carriage below the ends of the axles, and passing bands or straps round the relief wheels and the small wheels fixed on the axles, which bands or straps may be made elastic so as to serve as springs to the body of the carriage; or a further variation may be made by placing loose wheels or pulleys on the axles to receive such straps or bands, and other modifications made according to circumstances.

Another improvement in carriages consists in causing the carriage to travel upon a series of rollers, the axles of which are connected with endless chains passed round wheels mounted near each end of the carriage frame, the endless chains bringing the rollers in succession beneath such carriage frame.

Another part of the invention consists in forming the springs upon which the body of a carriage rests of a series of air beds or cushions which are placed upon platforms resting upon the axles of the wheels, the lower portions of the carriage body resting upon the cushions, and being provided with guide rods; these portions of the carriage being, moreover, made in the shape of "inverted open boxes," which prevent the access of dust to the cushions, and this being further guarded against by the boxes and platforms being connected by folds of caoutchouc cloth or other suitable material.

The invention also relates to a method of mounting omnibuses and similar vehicles upon their wheels. An omnibus is shown carried upon eight wheels, there being two wheels carried upon a short axle in the place of every one of the four commonly used. These axles may respectively be pivotted on centres, and connected by cross levers with one another, so that the movement to right or left of the pole swivels all the wheels; or the axles may be fixed. The seats of the omnibus may be placed over these wheels.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1842, September 29.—No. 9483.

WILKEY, JOHN FRY.—“Improvements in carriages.”

This invention relates to “a mode of applying a hind or “third wheel to carriages.”

The invention is of course described with reference to a vehicle having two main wheels only. These wheels work upon an axle as usual, and to the axle is affixed a certain hind framing, which projects backwards from the axle, and carries at its hinder part a bearing in which an upright axis is mounted, a second frame, projecting downwards from the first, having at its lower part a horizontal axis on which the third wheel turns, the upright axis having upon it a circular locking plate which is capable of turning in a hollow locking plate carried by the hind frame, the result of this arrangement being that the hind wheel is capable of locking or turning out of the direct course when requisite.

The patentee mentions, as an important feature of the invention, the placing of the body of the carriage upon the axle and hind framing connected therewith “in such manner “that there is the elasticity of springs between it and the “three wheels, consequently any shock to either of the wheels “will be conveyed to the body through springs,” this not having been the case in former arrangements in which a third wheel was used.

The details of the invention may be varied, in some cases the hollow locking plate being dispensed with. Suitable arrangements are made for lubricating the parts.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1842, October 20.—No. 9497.

STATHAM, JAMES.—“Improvements in the construction of  
“locks for Venetian blinds used in carriages.”

Before describing the details of this invention the patentee mentions that according to the ordinary arrangement of locks for Venetian blinds in carriages two operations are required to open and two to close such blinds, the movement of a bolt or latch being in the first place required to unlock the blind, and the opening of the blind being then performed by a slide, while to close the blind the bolt or latch has again to be moved, and a tape or strap used to complete the operation, these arrangements not only causing trouble in the working of the blinds, but frequently leading to the blinds being damaged by persons who are not in the habit of using them. He then states that the object of this invention is so to arrange locks for such blinds “that by the simple act of unlocking a blind the  
“same shall be opened by a spring, and that in the act of  
“again closing the blind the spring shall be brought into a  
“condition to re-open the blind when the same is released or  
“unlocked.”

The details of the invention may be variously modified. Arrangements, however, are described in which a tape or band is connected with the inner edge of each part or bar of the blind, this band or tape passing over a pulley at the upper part of the window and thence downwards to the lower part of the window, being there attached to a thin strip of metal which is in connection with a cord passing into the lock. This cord is coiled round a barrel in which a spring is enclosed, there being combined with this part of the apparatus a certain presser plate, a lever, a sliding bolt, a click or stop acting upon ratchet teeth formed outside the spring barrel, and other small mechanism the arrangement of which will only be understood with the aid of the drawing annexed to the specification, the result of the whole arrangement being that the presser plate being pushed in one direction sets free the spring barrel, which then winds a portion of cord upon it, thus opening the blind, a certain tape or strap being employed to close it again when requisite, and the action of this tape or strap restoring the spring barrel and other parts into their first

positions, so as to be again ready for opening the blind when requisite.

[*Printed, 1s. Drawings.*]

A.D. 1842, October 27.—No. 9499.

HAZELDINE, GEORGE.—“Certain improvements in omnibuses.”

This invention “consists of so constructing omnibuses that single seats are fixed on hither side, and in such manner that passengers enter up the centre and take seats one behind the other, in place of the passengers, sitting side by side with each other on the same seat, and face to face and opposite the passengers on the seat on the other side of the omnibus,” the patentee stating that by this arrangement each passenger will have the comfort of a separate seat, and at the same time the passage into and out of an omnibus so constructed will be more free, as the central portion of the omnibus will not be occupied by the legs and feet of the passengers.”

An arrangement is described in which the vehicle is constructed to carry twelve passengers, the arrangement being such that the two nearest the front of the carriage will sit face to face, but sideways in respect to the horses or otherwise, a back and elbow being provided for each seat. These arrangements may be varied, “and, if desired, all the seats may be so arranged that the passengers might sit with their faces or backs towards the horses, in which case the length of the omnibus, would require to be in some degree increased.”

[*Printed, 6d. Drawing.*]

A.D. 1842, November 8.—No. 9515.

SPINKS, JOHN, the younger.—(*A communication.*)—“An improved apparatus for giving elasticity to certain parts of railway and other carriages requiring the same.”

“This invention consists in substituting for the ordinary coach springs a metallic cylinder and a metallic piston made to fit air-tight into the cylinder. Between the top of the cylinder and the piston such a quantity of atmospheric air or other permanently elastic gas is forced as to enable

“ that compressed air by means of the apparatus in which it  
 “ is confined to give elastic support to carriages in lieu of the  
 “ ordinary springs now in general use, and to give elastic  
 “ resistance between carriage and carriage on railways, in  
 “ lieu of the buffers now in general use.”

In applying this apparatus as a bearing spring, the cylinder which is inverted is bolted to the frame of the carriage, and has a cover fitted thereto, the rod of the piston passing downwards through a cover bolted to the bottom of the cylinder, and its lower end being of convex form and resting in a cup or concavity on the upper side of the axle box, the lower cover being furnished with a stuffing box, and the upper cover with a passage for the condensed air or gas which is forced into the cylinder by a pump, the passage being furnished with a suitable valve inside the cylinder and a screw plug, by which it may be closed from the outside.

Between the lower side of the piston and the lower cover is an opening in the cylinder through which air can pass to and fro as the cylinder rises and falls, and the upper side of the piston is furnished with a cup of leather which serves as a packing, oil floating upon this packing and both lubricating the cylinder and preventing the compressed air or gas from passing to the lower side of the piston. As applied to buffers, the arrangements are very similar, the cylinders, however, being placed horizontally, and being longer than in the other case, the convex ends of the piston rods entering into concave recesses in the ends of the buffer rods.

[*Printed, 9d. Drawing.*]

A.D. 1842, November 25.—No. 9526.

RALLI, PANDIA THEODORE.—(*A communication.*)—“ Improve-  
 “ ments in the construction of the framing and wheelwork of  
 “ railway and other carriages, waggons, and carts, and of  
 “ locomotives and tenders.”

This invention relates firstly, “ to a method of using and  
 “ applying loose wheels to railway and other carriages, waggons  
 “ and carts.” Each wheel is upon a separate axle, such axles being sustained in suitable framework, upon which the body of the carriage or waggon rests; the framework of one carriage being connected with that of another by projecting parts



furnished with joints, such joints being opposite the middle parts of such framing, this arrangement enabling a train of such carriages or waggons to pass with facility round the curves in the rails.

This invention also includes the use of a roller, mounted in a moveable frame, for the purpose of rolling or transferring the body of a waggon on to the framing on which it is to travel.

[*Printed, 10d. Drawings.*]

A.D. 1842, December 8.—No. 9547.

BODMER, JOHN GEORGE.—“Certain improvements in the  
“ manufacture of metallic hoops and tyres for wheels, and in  
“ the method of fixing the same for use, and also improve-  
“ ments in the machinery or apparatus to be employed  
“ therein.”

This invention relates principally to rolling hoops and tyres for wheels, “so as to give them at one operation their true  
“ shape.” The necessity for afterwards turning them in a lathe being thus dispensed with, and it consists partly in an improvement upon a former invention, No. 8070, A.D. 1839. In the present invention, a bar of iron is first rolled or hammered into a shape “most convenient for the finishing process,” and is then bent into the form of a ring, and has its ends welded together. It is then placed in a machine in which it rests upon a horizontal bed plate (which may be provided with rollers to support the ring if desirable), and is then acted upon between rollers working on vertical axes, one of these rollers being of such form as to give the proper finished figure to the outside of the ring, while the other roller finishes the inside of such tyre. The machine is described as operating upon a flanged ring suitable for the tyre of a railway wheel, and for the purpose of clearing the tire of its “scale,” and hardening it as much as possible, a stream of water is discharged upon it when the operation is nearly completed, “and it is left just  
“ warm enough to contract sufficiently when put upon the  
“ wheel.” The roller which finishes the outside and flange of the tire is mounted upon a shaft or axis, so arranged in its bearings that the roller may be moved from or towards the tire by means of a screw. The inner roller is upon another shaft, which can be raised or lowered in order to facilitate the

placing of the tire upon the bed plate, and removing it therefrom, and in addition to these rollers certain guide rollers are employed, which are also adjustable by means of screws, these keeping the tire steady as it travels round on the bed plate, and a small roller is also so mounted as to bear constantly against the interior of the tire, the apparatus with which it is connected constantly indicating the different diameters assumed by the tire as the process of rolling proceeds.

Tires for common carriage wheels may be formed in a similar manner, one form of tire being described, which is convex on the exterior surface and concave in the interior, this tire, when shrunk upon a wheel, retaining its position without the aid of nails or screws. The invention also includes a machine, by means of which a "lump" of metal brought from a puddling furnace may be gradually reduced into the form of a bar, the patentee stating that the "sudden reduction" of a lump into the form of a bar is liable to derange the fibres of the iron. This machine consists mainly of a trough, in which the lump to be operated upon is placed, being passed thence between rollers, which are three in number, the metal resting upon two of these which work in stationary bearings, and the third roller being mounted in bearings which are moveable, this roller being gradually forced down upon the metal by means of a screw while the work proceeds. This invention is described at some length, and under various modifications.

[*Printed, 1s. 11d. Drawings.*]

A.D. 1842, December 8.—No. 9548.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Axles, axleboxes, and axletrees. In these improvements, two metal rollers of the same or different diameters, and the wrought iron axles of which are placed horizontally or slightly inclined, rest (at the lower opening that is made between them) upon the turned part of the axle tree. The turned part is a little longer than or at least equal to the width of the rollers. These rollers are made of such a length or breadth that they will not oscillate or rock, and therefore they will not create any injurious shocks. The axles of the rollers are supported against brass or bronze bearings, formed in a cast iron box, fixed by means of four bolts to the under part of the shaft. Another

bearing partially surrounds at its under side (but without any sensible friction) the turned part of the axletree, and is supported by a bridle piece, which is bolted to the under part of the cast-iron box. This arrangement is adopted in order to keep the axletree in its proper place under the rollers, and prevent it from being disturbed by shocks or other causes, which might tend to disarrange it. The bearing piece may be made hollow, so as to answer the purpose of a grease box (in the manner they are employed upon railways), by means of a small cylinder of cork or deal floating upon some oil, which is poured into the said hollow. The bearing is, however, maintained in contact with the axletree, which, as well as the two rollers, are by this means kept properly lubricated, the object of the invention being to reduce the friction of axles, and so cause carriages to travel more easily than usual. The whole apparatus is surrounded by a case of thin sheet iron, which not only protects it from mud and dust, but also serves as a reservoir for an oil bath in case the hollow bearing piece mentioned above is not employed as a grease box, another sheet iron covering protecting the rim of the wheel.

[*Printed, 10d. Drawing.*]

A.D. 1843, January 31.—No. 9619.

BODDY, WILLIAM BARNARD.—Windows. This invention consists in applying rack catches to window sashes and frames, which are used with a spring bolt opened by a key or by a finger knob or otherwise, for the purpose of fastening or sustaining such windows. Various modifications of the invention are shown, and it is claimed as useful for carriage purposes.

[*Printed, 10d. Drawing.*]

A.D. 1843, February 11.—No. 9632.

WOLFERSTAN, THOMAS.—Axles and axle boxes. The axle arm is made hollow to serve as a receptacle for the lubricating oil, which is introduced through an aperture closed by a screw plug. It runs in a box in which it is secured by an iron collar and bolts, and leather washers make the joint tight. The oil escapes from the receptacle through a small perforation and is distributed round the axle by means of a groove cut thereon.]

[*Printed, 5d. Drawing.*]

A.D. 1843, February 17.—No. 9635.

BOYDELL, JAMES, junior.—“Improvements in apparatus for retaining the wheels of carriages in the event of an axle breaking or otherwise.”

This invention “relates to certain apparatus combined with the use of such description of axles as run from side to side of the carriages to which they are applied, each axle having two wheels affixed or turning thereon,” the apparatus being “so arranged as to prevent the wheels getting away when any of the axes break, and also prevent the wheels coming off the axes in the event of linch-pins or other fastenings coming out.”

An arrangement is described in which certain bars affixed to the framing of a vehicle are provided with forked ends which partially embrace, without touching, the rims of the wheels, the result of the arrangement being that should an axle break, or a linch pin become disengaged, or the wheel become otherwise disconnected from the axle the bars, by resting upon the wheel, will sustain the vehicle, and prevent it from overturning. The invention is described as being applied to railway carriages, as well as to carriages for common roads.

[*Printed, 5d. Drawing.*]

A.D. 1843, March 2.—No. 9653.

WALKER, WILLIAM.—“Certain improvements in the manufacture of springs and axles for carriages.”

This invention consists in the first place in a mode of constructing an elliptic spring in which three plates of steel are used in forming each portion or side of the spring, such plates being of uniform thickness, but having the edges tapered off towards each extremity, similar but larger plates of steel forming the internal parts of the spring, and having their ends formed into eyes for the reception of the shackle or connecting bolts. The plates may be held together by bolts or clamps, and the arrangement may be varied by using plates of steel, the thickness of which diminishes from the middle towards each end, in addition to such plates being tapered off towards the ends, as mentioned above.

That part of the invention which relates to axles consists in forming the outer portion of the axle hollow, such axle

having a "screwed end" for the reception of a cap, the periphery of which is divided into eight or more sides, in each of which there is an oblong hole for the admission of a screw. The hollow portion of the axle forms an oil chamber, and small holes are made in this portion of the axle through which the oil circulates when the wheel is in motion. A cap furnished with a shoulder is screwed upon the end of the axle when the wheel has been placed thereon, there being a shoulder forged on the axle, against which the box of the wheel works, and certain collars at the ends of the box, certain "leathers" and metal cones, completing the arrangement, the result of which is to not only keep the wheel securely in its place upon the axle, but also to prevent the escape of the oil used for lubricating the axle.

[*Printed, 5d. Drawing.*]

A.D. 1843, March 30.—No. 9684.

HILLS, FRANK.—Steam carriages. This invention relates, among other things, to a method of driving the propelling wheels. They are fixed to tubes or hollow axles which are placed loosely on the driving axle, and which are carried round by means of two bevel wheels placed loose upon a pin or cross head fixed to the driving axle and at right angles to it. These two bevel wheels gear into two others fixed on the hollow axles. The cranks on the driving shaft are outside the framing, and are worked from vertical cylinders by means of bell cranks. By this arrangement either wheel is free from the other. The invention also relates to an improved condenser placed between the driving wheels and between the boiler and the carriage.

The steering is performed from the front by means of a vertical rod which works by bevel gearing a horizontal shaft below. This latter carries a worm which gears with a wheel secured to the turning plate.

The driving wheels are of iron. The spokes have T-shaped pieces welded to their outer ends, their inner ends are cast into the nave of the wheel in two rows. From the nave they cross each other and between their outer ends or T pieces are fitted the felloes. The tire is put on in strakes.

[*Printed, 2s. 1d. Drawings.*]

A.D. 1843, April 13.—No. 9697.

RANWELL, WILLIAM.—“Improvements in machinery or apparatus for registering or indicating the number of persons which enter any description of carriage, house, room, chamber, or place, and also the number of passengers and carriages that pass along a bridge, road, or way.”

The mode of carrying out the invention may be varied, but the patentee sets forth three modes of applying the improvements to an ordinary omnibus. In one case the vehicle is furnished with additional steps or treads placed above those ordinarily employed, these additional steps or treads, when acted upon by the feet of passengers, bringing into action certain levers and rods, which, through the medium of a bent arm, a ratchet rack, and other minor apparatus connected therewith, give motion to certain toothed wheels which carry indices on their front sides. Suitable protection is afforded to the apparatus by the application thereto of a metallic shield and a leather or other flexible band, the door of the vehicle, moreover being so arranged as to prevent the apparatus from acting except in the opening of such door.

This arrangement may be varied by substituting pulleys for the levers mentioned above, and one modification of the invention is described, in which the additional steps are furnished on their under sides with plungers, which, on the depression of the steps, act upon balls, or upon quicksilver, water, oil, or other liquid, by means of which apparatus connected with proper indices may be put in motion. One arrangement is described, in which a number of balls are enclosed in a vessel or chamber furnished with a slide valve, the latter being acted upon by the moveable steps, and allowing a ball to fall from the vehicle or chamber at each movement of the steps into a box or chamber placed to receive it, the number of balls dropped into the latter showing, at the end of each journey, the number of passengers who have entered the conveyance.

These arrangements may be variously modified, and so adapted not only to omnibuses and other public vehicles, but also “to bridges, roads, or ways, to indicate the number of persons or vehicles passing over or along such ways.”

[Printed, 10d. Drawing.

A.D. 1843, April 22.—No. 9709.

VIOLETTE, FRANÇOIS CONSTANT MAGLOIRE.—(*A communication*.)—Warming carriages. A case is fitted in the bottom of the carriage, running parallel with the seats, upon which case the passengers are to put their feet. It is made shallow in those parts which would otherwise interfere with the springs or framing, and is fitted at the ends with oil lamps. The heat from the lamps fills the case and escapes through a number of small holes along the upper parts of the sides of the case into the carriage. The lamps are supplied with air through holes which are protected by a guard, and chimneys may be added to make combustion more complete. The lamps are either put in through doors at the ends, or suspended in tubes or collars in the case bottom by pins.

[*Printed, 10d. Drawings.*]

A.D. 1843, May 15.—No. 9724.

NEWTON, WILLIAM EDWARD.—(*A communication*.)—Axle-boxes. The first part of this invention consists in forming axle boxes with “rims or fillets along their edges and at their ends, or at their ends only,” according to circumstances, and then lining such boxes with a metallic composition or alloy, “of which tin is the basis,” the patentee stating that boxes thus prepared are less liable to “heating and abrasion” than the boxes ordinarily used. The “rims or fillets” are meant to retain the lining in position, but a portion of such lining covers the edges of such rims or fillets, and so prevents contact between them and the surface of the axle or other mechanism moving within the box. Instead of “rims or fillets,” knobs, projections, or “holes” may be so arranged as to retain the lining of the box, the lining being run into the latter in a melted state.

Another part of the invention consists in a mode of constructing oil boxes, applicable among other purposes to the axle boxes of carriages. In the lower part of the axle box a chamber is formed, having a passage leading therefrom to the outside of the box, through which oil can be introduced, a kind of “double tube” being placed in this passage, which, while permitting the entrance of the oil, prevents it from being thrown out in case of concussion, the passage, moreover, being

furnished with a suitable cover. In the chamber is mounted a weighted lever, the heavier end of which constantly keeps the other end raised within an opening in the upper side of the oil box or chamber, this end of the lever being provided with a flat cotton wick, or some other substance which serves, by means of capillary attraction, to convey a constant supply of oil to the axle, with which one part of it is in contact, while the lower ends thereof dip into the oil in the chamber.

[*Printed, 7d. Drawing.*]

A.D. 1843, May 16.—No. 9727.

KETTLE, JOHN LUCENA ROSS, and PROSSER, WILLIAM, junior.  
“Improvements in the construction of roads, and in carriages  
“to run thereon.”

One part of this invention relates to constructing engines and carriages for use on railways with wheels having plain tires, and adapting them to run upon plain rails or trams of wood, such engines and carriages being prevented from leaving such rails or trams by the use of a central guide rail and a flanged guide wheel mounted below the carriage or engine so as to travel immediately above such guide rail. And another part of the invention consists in mounting below engines and carriages, guide wheels having V-shaped grooves, which are placed in an inclined position so as to be close to the inner corners of the rails or trams, the central guide rail being thus dispensed with, and these guide wheels supporting the carriage or engine in case of accident to the ordinary wheels or axles.

[*Printed, 9d. Drawing.*]

A.D. 1843, June 27.—No. 9804.

WALLER, RICHARD.—“Improvements in locomotive carriages,  
“and in steam boilers and engines.”

[*No Specification enrolled.*]

A.D. 1843, July 20.—No. 9848.

HARVEY, JOSEPH.—“Improvements in the construction of  
“two-wheeled carriages.”

This invention consists “in so constructing two-wheeled  
“close carriages that the driver, though within a compart-



“ ment of a carriage, may be separated from the three passengers ” which a carriage constructed according to the invention is arranged to carry.

A vehicle is described in which the seats are so arranged that two passengers sit with their faces towards the horse, while a third sits behind them and on one side of the vehicle. On the opposite side of the vehicle is a compartment arranged for the driver, this being so contrived that his head and the upper part of his person may come above the top of the carriage, “ thus giving the driver a safe seat where he can have “ full power over his horse.” The door for the entry and exit of passengers to and from the vehicle is at the back of the vehicle, the driver entering by a door at the side which may, however, be at the back if preferred. Suitable steps are placed for convenience of access to the vehicle, and the latter is provided with windows both at the front and sides, but the shape of the body of the vehicle may be varied, the wheels, axle, shafts, and springs being arranged in the ordinary manner. A small door is provided, by means of which the passengers may communicate with the driver when requisite.

[*Printed, 8d. Drawing.*]

A.D. 1843, October 5.—No. 9887.

BRIGGS, JOHN GEORGE.—Axles. This invention consists “ in “ forming axles of two pieces or shafts, one solid and the “ other hollow, the former fitting within the latter, by which “ combination much greater strength and less risk of breakage “ are obtained with the same quantity of metal than when “ the axle consists wholly of a solid or a hollow shaft.”

One arrangement is described as suitable for railway axles, in which the two wheels are keyed upon an outer hollow shaft, through which a solid shaft is passed and keyed firmly therein, the ends of the latter projecting beyond the hollow shaft, and forming the bearings or journals of the axle. In another arrangement the solid and hollow shafts are of the same length, the bearings being formed of the outer ends of the latter. The shafts may be cylindrical, or of any other suitable form, and the invention is mentioned as being applicable to the axles of both railway and other carriages, and also to rotating shafts and axles of every description.

[*Printed, 9d. Drawing.*]

A.D. 1843, October 5.—No. 9894.

SAUNDERS, JONATHAN.—“Improvements in the manufacture  
“ of tyres of railway and other wheels, and in the manufacture  
“ of railway and other axles.”

This invention relates to “a mode of manufacturing the  
“ tyre of railway and other wheels by so piling steel with  
“ iron that the steel may be at those parts of the surfaces  
“ most liable to wear when the piles of steel and iron are  
“ rolled out into bars suitable for the tyre of railway and  
“ other wheels.” The pieces of steel used are piled with the  
iron, and the pile heated to a welding heat, and passed under  
the hammer and formed into a bloom, and then passed between  
suitable grooved rollers and formed into a bar suitable for a  
railway or other wheel, in like manner to what is ordinarily  
practised when making tire bars for railway or other wheels  
when only piles of pieces of iron are used. The patentee does  
not confine himself to any particular arrangement of the  
parts of the pile, but remarks that he has in some cases  
covered the steel in the pile with a thin surface of iron, which  
is removed in turning the wheel. By a disclaimer which was  
enrolled on the 4th of April 1844, the patentee disclaimed  
that part of the title of this invention which is contained in  
the words relating to the manufacture of railway and other  
axles, stating that he had found the invention which he had  
intended to describe under those words to be wanting in  
utility.

[*Printed, 7d. Drawing.*]

A.D. 1843, November 7.—No. 9928.

ROWAN, WILLIAM.—Axles and axlebox. This invention is  
described as being applied to the axle of a railway carriage,  
the patentee stating, however, that it may be applied to other  
purposes. The wheel is constructed as usual, and the axle,  
so far as regards the parts between the wheels and their  
bearings, may be of any convenient form. Each end of the  
axle, is, however, somewhat prolonged, and slightly diminished  
in diameter, and mounted upon each end of the axle is a  
“friction cylinder or wheel carrier,” this consisting of two  
rings placed some distance apart, and connected by four  
longitudinal bars, each of which serves as an axis to one of

four cylinders or wheels, these latter, in fact, working between the axle and the interior of a socket secured to the framework, and serving as anti-friction rollers. The ends of the friction cylinders are bevilled or rounded off, and abut at such ends against correspondingly-shaped portions of the axle and bush, by which they are prevented from swaying to either side in working. A screw cap and nut further secure the whole in their places, and an external plate guards the socket from the entrance of dust. Conical instead of cylindrical friction wheels may be used if desirable.

[*Printed, 8d. Drawing.*]

A.D. 1843, December 8.—No. 9984.

VINGOE, HENRY, and VINGOE, WILLIAM HENRY.—“Improvements in apparatus for planting or setting, drilling, or dibbling corn, grain, seed, pulse, or manure; parts of which improvements are also applicable to the construction of wheels and carriages.”

One part of this invention relates to an arrangement of wheels and axles in which the axles work between beams composed of either iron or wood, these beams having recesses or boxes formed in them, with suitable arrangements for the reception of friction rollers, the arrangement being such that the main body of the vehicle is sustained by large friction rollers placed directly over the axles, while other and smaller rollers, placed one on each side of each axle, preserve the parts in their proper positions. The rims and spokes of the wheels are of the ordinary character, certain cross and other bars in the arrangement set forth being used to bind the parts of the framing of the vehicle together.

[*Printed, 10d. Drawings.*]

A.D. 1843, December 18.—No. 9990.

PARLBY, SAMUEL.—Wheels. This invention is described at great length, and consists in the first place in forming the spokes out of flat pieces of wood, one edge of each being bevilled or chamfered at the part which is to enter the nave of the wheel, while the other edge is not so bevilled, the nave of the wheel being formed by placing these parts of the spokes between two circular plates or discs of iron “secured together by at least one cross pin for each spoke,” such pins pass-

ing entirely through both of the plates or discs as well as through the spokes. The central parts of the wheel are thus firmly united, independently of any box or axle which may afterwards be connected thereto.

As regards the rim of the wheel the invention consists in placing on each side of the outer parts of the spokes a flat ring of iron, and then uniting the spokes and rings by means of pins which pass through both rings and spokes, the spaces between the spokes being then filled up by segments of hard wood or any other suitable substance, these segments being "shaped like the keystones of an arch," the grain of the wood, when they are composed of wood, pointing towards the centre of the wheel, and the segments, like the spokes, being secured between the iron rings by pins. Both the outer ends of the spokes and the outer edges of the segments project beyond the rings in some cases, and are in such cases surrounded by an iron tire, which may either be plain and adapted to run on a common road, or flanged so as to be suitable for working upon a railway. In other cases the rings extend to the ends of the spokes and the outer edges of the segments, and will thus bear upon the road equally with them, one of the rings being, for railway purposes, however, made to project beyond the segments and spokes, and so serve as a flange to the wheel. These arrangements may all be variously modified, the outer ends of the spokes being in some cases shod with iron, and furnished with shoulders against which the rings may rest, and when the segments and spokes are surrounded by an iron tire the wood of the segments may have the grain lengthwise, instead of the grain pointing towards the centre of the wheel, as mentioned above. The segments may be composed of leather, felt, or other elastic substance, "cemented and compressed together with great force," in moulds of suitable form.

An improved axle box is described, which, however is not claimed by the patentee, this box being tubular in the part meant to contain the arm of the axle, but having at its outer end a "hemispherical oil cavity," the end of the axle being convex, so as to fit against the interior side of the oil cavity, and there being a groove in the arm of the axle to facilitate the distribution of oil around the arm. No linch pin is required for the axle, as a collar fixed or formed upon the

axle works within a hollow piece of metal fixed upon the inner end of the box by screwing or otherwise. The oil is introduced into the oil cavity through a hole which is afterwards closed by a screw plug, and within the cavity are projections, which as the box revolves, will carry up a continuous supply of oil to the axle.

[*Printed, 1s. Drawings.*]

A.D. 1844, February 24.—No. 10,072.

ROUSE, WILLIAM.—“Certain improvements in carriages and  
“parts of carriages, applicable to various purposes.”

This invention consists in the first place “in a mode of  
“constructing carts and waggons and similar carriages, so  
“as to avoid the cutting of mortices in the cills or frame of  
“the waggon or other carriage to receive the standards or  
“ribs by which the sides are fixed and sustained, and so as  
“that such sides may be readily and separately removed and  
“refixed, as occasion may require.” The patentee mentions  
that in the ordinary mode of constructing these vehicles a  
number of upright ribs or staves are driven tightly into mor-  
tices cut in the cills or frame of the carriage, the side planks  
being attached to these ribs or staves, but that “the cills or  
“frame are weakened by the mortices being cut therein, and  
“the sides cannot be removed,” whereas according to the  
present invention “the planks which compose each side are  
“framed together so as to constitute one piece, which is  
“attached to the carriage in a mode which admits of its  
“being readily removed or replaced as occasion may require.”  
An arrangement is described in which certain horizontal bars of  
iron are connected with a central beam by being turned down  
and bolted thereto at one end, while the other end is formed  
into a screw, the screwed end of these bars passing through  
holes in certain standards to which the planks which compose  
the sides of the vehicle are attached, the whole being secured  
together by nuts.

Another part of the invention relates “to the wooden axles  
“employed in some classes of carriages used in agriculture,  
“and consists in a method of increasing the strength of such  
“axles by combining them with iron,” this part of the  
invention being carried into effect “by cutting a vertical

“ groove through the line of the axis, and inserting therein  
“ an iron plate, secured by bolts or rivets, or by other equi-  
“ valent means;” the arm or portions of the arm on which  
the wheel works being surrounded by “ a cone, or conical  
“ rings or hoops of iron,” an arrangement being set forth in  
which two rings or hoops, or shoulders, are placed upon an  
axle, the inner being of greater diameter than the outer ring  
or shoulder.

[*Printed, 6d. Drawing.*]

A.D. 1844, February 24.—No. 10,073.

JACKSON, PETER ROTHWELL.—“ Improvements in the con-  
“ struction and manufacture of wheels, cylinders, hoops and  
“ rollers, and in the machinery or apparatus connected  
“ therewith; and also improvements in steam valves.”

The only improvement appertaining to this series com-  
prised by this specification “ consists in the application of  
“ guano, as a substitute or material to be employed in the  
“ hardening of hoops, cylinders, rollers and wheels . . . in  
“ the place of bone dust and other matters now commonly  
“ employed.” This improvement was, however, subsequently  
disclaimed by an instrument dated 4th Feb. 1858, No. 10,073\*.

[*Printed, 6d. With Disclaimer. No Drawings.*]

A.D. 1844, March 4.—No. 10,090.

ATKINSON, SAMUEL.—“ Improvements in the construction  
“ of wheels for carriages.”

This invention relates to a mode of constructing wheels for  
carriages “ whereby iron or ether metal spokes are combined  
“ with naves and felloes of wood.”

A mode of carrying out the invention is described in which  
a nave and also a ring or felloe is formed of wood, these being  
connected by spokes of iron, which may be of the ordinary  
form adopted in spokes, or otherwise. The inner ends of the  
spokes, which enter the nave, are either jagged to fix them  
in the nave, or secured therein by screws, nuts and screws  
being in some cases used to fix the outer ends of the spokes  
in the felloe. In other cases the spokes are formed of tubes  
filled with wood, and in these cases the spokes are fixed both  
in the nave and felloe by means of wedges, which, being

forced into the wood, expand the ends of the spokes, this expansion of the ends of the spokes being facilitated by splitting the ends of the tubes. The details of the invention may be varied.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1844, March 30.—No. 10,131.

CROSSKILL, WILLIAM.—“Improvements in machinery for making wheels for carriages.”

This invention is set forth at considerable length, and illustrated by a number of elaborate drawings. The main features of the invention, however, will be sufficiently understood from the following abstract of the claims made by the patentee, which include, firstly :—

The combination of a mandril and revolving cutters whereby the spokes fixed in a nave are in succession presented to the action of the cutters, and their ends are formed into tenons, all equidistant from the centre of the wheel.

Secondly, the combination of revolving cutters and rotatory or reciprocating saws, with a sliding plate or other equivalent contrivance, whereby the upper surface of the felloes is brought under the action of the revolving cutters, and the ends of such felloes are presented to the saws at the proper angle.

Thirdly, the combination of boring bits and a sliding plate or other equivalent contrivance, whereby the felloes are presented to the bits and bored with holes to receive the spokes and dowels.

Fourthly, the construction of a certain face plate, and a mode of fixing unfinished felloes thereto, while such felloes are brought into a finished condition by the use of certain properly arranged tools.

Fifthly, an arrangement of mechanism for bending the tires of wheels, in which certain fluted and plain rollers are used, the action of which may be varied so as to give to the tires a conical or dished form, or otherwise, as may be required; this part of the invention including particularly the employment of certain adjusting screws by which the position of certain of the rollers may be regulated.

[*Printed, 2s. 11d. Drawings.*]

A.D. 1844, April 18.—No. 10,145.

HEALE, EDGAR.—“ Certain improvements in the construction  
“ of carriages for the conveyance of passengers on roads and  
“ railways.”

This invention consists, firstly, in constructing the framing of the bodies of carriages in general of wrought-iron bars, welded together and covered with plates of metal, the metal plates forming the sides and ends may be embossed or stamped, and thus produce a novel and elegant appearance. A carriage is described as adapted for twelve inside and eleven outside passengers, being divided into three compartments, each capable of holding four persons, and such compartments being arranged at different heights from the ground in order to afford accommodation for outside passengers on the roof, but this carriage is meant for use on common roads only. The seats are of sheet steel bent into the shape of a loop. The hind axle is cranked.

Another method of mounting the hind wheels is described. They are placed on short axles or studs attached to pieces sliding vertically in grooves or frames in the carriage body. A guide rod is provided surrounded by a spiral spring.

The glass of a window is fitted into a metal frame which works in metal grooves. A ring fitted to the upper part serves as a handle. The bottom of the space into which the window drops is fitted with an india rubber or leather cushion.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1844, April 27.—No. 10,161.

DAVIES, ISAIAH.—Propelling carriages. This invention relates chiefly to an improved form of rotary engine, the description of which does not come within the scope of this series. It also relates to a method of applying the power to be derived from this engine to the propulsion of carriages.

This is effected by fitting the rotating axis or shaft with a worm wheel or endless screw to gear with a pinion on the wheel axle. Or there may be two sets of toothed gearing capable of variable adjustment to effect varying speeds. Again the axis may be prolonged longitudinally and be fitted with further and similar gearing to work another pair of wheels.



The worm wheel or endless screw is to be cast in a chill. This chill is shown made up of segmental pieces held together by a hoop.

[*Printed, 2s. 2d. Drawings.*]

A.D. 1844, April 30.—No. 10,169.

HAYMAN, JAMES.—“An improved construction and arrangement of certain parts of omnibusses and other vehicles.”

This invention consists in the first place in “having two doors or half doors to the entrances at the backs of omnibusses or other carriages.” An arrangement is set forth in which two half doors are used. The edges of these half doors are rabbitted, the edge of one lapping over that of the other when closed, and that with the outer edge being constantly pressed open by a spring when not otherwise acted upon, this allowing the other half of the door to be opened also for the admission of passengers. When the half doors are closed, however, they are kept in that position by means of a spring bolt, which is mounted so as to slide up and down in that half of the door which overlaps the other and is capable of descending into a socket placed in the sill or lower frame of the door. The board on which the conductor usually stands is moveable, and is connected with one half of the door by a chain the links of which are so formed that when that part of the door is opened the board is pressed out of the way, beneath one of the seats of the carriage, being again drawn out for use when the door is opened. The platform behind the vehicle has attached to it a step on each side, by which means passengers may ascend to the platform without first descending into the road, and a guard or rail is affixed at the back of the platform, as well as handles on each side the half doors to assist passengers in entering and leaving the vehicle.

[*Printed, 8d. Drawing.*]

A.D. 1844, May 7.—No. 10,173.

WRIGHT, JOSEPH.—“Improvements in railway and other carriages.”

The greater part of this invention relates to improvements for railway purposes, which are treated in another series of abridgments.

Part, however, consists in suspending carriages on springs, “ which bear the load a certain distance from the ends, which “ are only brought into gradual action by an increase in the “ load.” Several modifications are described, such springs being applicable also as buffer springs.

[*Printed, 10d. Drawing.*]

A.D. 1844, May 14.—No. 10,181.

HILL, EDWARD.—“ Improvements in the manufacture of “ railway and other axles, shafts, and bars.”

This invention consists in constructing railway and other axles, shafts, and bars of iron “ rolled into such form that the “ section thereof is a cross,” the spaces between the parts of the cross being partially or wholly filled up with pieces of suitable form, and the whole welded into one bar by suitable means. If desirable, steel may be used in combination with iron “ either in forming the cross or centre bar or for the “ filling pieces.”

[*Printed, 5d. Drawing.*]

A.D. 1844, May 23.—No. 10,197.

MOOR, JOHN HENRY.—“ Certain improvements in the construction of carriages generally.”

This invention is described in the first place as being applied to an omnibus, the vehicle being constructed to carry twelve inside passengers, such passengers being seated in two lines, a division or partition extending along the middle of the omnibus and separating the two lines of seats, suitable padding and cushions being placed for the accommodation of the passengers, who sit with their backs next the partition. In addition to this division of the seats there are other minor divisions by which each line of seats is sub-divided into three compartments, each of these accommodating two passengers, and being provided with a door placed in the side of the vehicle by which the passengers may enter and leave the compartment. The entrance to and departure from these divisions of the vehicle are facilitated by the application of step irons and foot boards, the latter extending the entire length of the carriage on each side, and these irons and foot boards being capable of being raised and lowered by means of certain rods

and bent levers connected therewith. The axles of the vehicle may either be straight, or cranked, the latter arrangement admitting of greater space being allowed for passengers' luggage than the former.

[*Printed, 10d. Drawing.*]

A.D. 1844, June 12.—No. 10,226.

POOLE, MOSES.—(*A communication.*)—Wheels and axles. According to one modification of this invention, a wheel is constructed which has at the ends of the spokes a grooved rim, there being inserted into this groove blocks which compose the outer portions of the wheel. The grooved rim is formed by a flange projecting upwards at one side of the wheel, the other side of the groove being formed by curved plates, bolts securing the whole together. The “grain” of the wood radiates, and the blocks are rounded on the outside to prevent them from splitting, “beads,” projecting from the inner sides of the groove, aiding in keeping the blocks in their places. The invention may be applied to wheels of the ordinary construction by using plates to form both sides of the groove, and bolting them to the rim of the wheel as well as to the blocks. These wheels appear to be meant only for use on common roads.

That part of the invention relating to axles consists in so arranging such axles that the wheels run loosely thereon, the axles being stationary, and is described more especially with reference to railway axles, the wheels being thus enabled to turn independently of each other in passing round curves in the rails. According to one modification of the invention pieces of steel are let into the lower side of the axle, these pieces “receiving the friction produced by the revolution of “the wheel,” rings being secured in the box of the wheel, which turn upon the said pieces. The nave of the wheel is recessed between the rings, such recess serving as a reservoir for lubricating material, which is introduced into such recess through an opening provided with a pipe and a stopper. A collar on the axle against which one side of the nave bears, and a washer which is placed on the other side, keep the wheel in its place. The mode of keeping the wheel in its place may, however, be varied, and instead of the axle being stationary it may revolve, and be furnished with rings of steel

instead of having pieces on one side only, the nave in this case being furnished with either rings or separate pieces.

[*Printing, 1s. 6d. Drawings.*]

A.D. 1844, October 31.—No. 10,372.

BEADON, GEORGE.—Raising carriage hoods. The ordinary hood is raised by means of a lever which has at its lower end a toothed sector. A pinion works in this sector and when turned by a winch, moves the lever and by it raises or depresses the hood.

[*Printed, 10d. Drawing.*]

A.D. 1844, November 9.—No. 10,387.

PROSSER, WILLIAM, jun.—“Improvements in the construction of roads, and in carriages to run thereon.”

The first part of this invention consists in “a mode of constructing roads with tramways of wood, and also combined with guide rails for the guiding carriages thereon.” The rails for the reception of carriage wheels have each a flat surface, and the “guide rail” passes between them, each carriage being furnished with a wheel having a flange on both sides, which runs over the guide rail with its flanges at each side thereof, the carriage being thus prevented from leaving the proper track.

Another part of the invention consists in furnishing the carriages with grooved wheels (in addition to those which support the body of the carriage), so placed that the grooved portions run against or near the inner edge of each outer rail, the guide rail being dispensed with, and these grooved wheels serving to keep the carriage in its proper course. These grooved wheels may also be applied to a locomotive engine.

[*Printed, 9d. Drawing.*]

A.D. 1844, November 25.—No. 10,405.

MILLICHAPE, GEORGE.—“Improvements in the construction of axletrees.”

This invention has for its object “the obtaining greater security in preventing wheels coming off axletrees in case of the ordinary means failing, and consists in so applying screws to axletrees that, in the event of the ordinary

“ securities failing the wheels cannot come off so long as the carriage is moving onwards, the screws being so applied and arranged in respect to corresponding ones in the axletree boxes that the wheels can only be removed from their axletrees by turning the wheels back.”

A mode of carrying out the invention is described in which the axletree “ is for the most part of an ordinary construction,” but is furnished at the inner part of the arm with a screw thread, the box of the wheel being so arranged in correspondence therewith that “ in the event of there being no other means of retaining the axletree box, and consequently the wheel, on the axletree, so long as the wheel moves forward the axletree box would not come off the axletree.”

The invention includes a novel construction of collet, on the interior of which are formed two projecting ridges, and in place of one side of the screw at the end of the axletree being made flat, to correspond with the flat portion of the interior of the collet, the screw has a groove on each side, so that the collet can pass over the screw, the projections of the collet entering grooves formed in the bearing of the collet on the axletree.

[*Printed, 6d. Drawing.*]

A.D. 1845, January 11.—No. 10,456.

GOLLOP, JOHN.—Springs for carriages. This invention relates to various matters, including a method of applying springs to carriages.

Four spiral springs are placed in a barrel attached along the axle tree. At one end these springs abut against projections in the barrel, at the other against projections in a moveable cap placed at each end of the barrel. The carriage is suspended from arms fixed to these caps, consequently the compression of the springs by the partial rotation of the caps gives the required elasticity.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1845, February 10.—No. 10,514.

MABERLY, FREDERICK HERBERT.—Brakes. The greater part of this specification, which is of great length, is devoted to

the description of certain brakes and other improvements in railway rolling stock. Part of the invention, however, relates to brakes for common road carriages, and of these several varieties are shown. These brakes embody the following principles:—Firstly, locking the wheel by means of a clutch which engages with stops on the nave; secondly, drawing up the brake block by means of a rack and a pinion on the nave; thirdly, tightening a band round the nave; and, fourthly, depressing a lever having a roller at its end, so that the latter comes on the ground against the wheel.

[*Printed, 2s. 2d. Drawings.*]

A.D. 1845, March 18.—No. 10,571.

RAYNER, HENRY SAMUEL.—“ Certain improved means of preventing accidents to carriages on railways and common roads.”

This invention consists “ in protecting carriages on railways  
“ and common roads from such accidents as arise from collisions with other carriages or solid bodies, and this by means  
“ of a buffing apparatus attached to one or more or to each of  
“ such carriages, or placed in suitable situations in relation to  
“ them, which apparatus depends for its action on the elastic  
“ properties of air and water, and opposes a resisting power  
“ proportional to the weight and velocity of any body acting  
“ upon or striking against it.”

An arrangement is described in which an outer cylinder is attached to the framing of a railway carriage, and has within it a cylinder composed of two longitudinal portions separated by a diaphragm, the inner cylinder, however, projecting to some extent from, and being capable of sliding to and fro within the first. The outer portion of the inner cylinder is filled up with wood, the next portion behind the diaphragm is filled with water, and this portion also encloses a piston, the rod of which passes through and is secured behind the outer cylinder. This piston is thus fixed, and is provided with a number of holes, and the result of the arrangement is that on the buffer head, which is fixed upon the outer end of the inner cylinder, being forced inwards, the water in the inner portion of the inner cylinder is driven through the holes in the piston, the resistance offered to the passage of the water through

such holes, together with the compression of the air in the outer cylinder by the entry of water therein, affording an elastic medium of resistance to the action of the buffer.

This arrangement may be variously modified, and the invention adapted for stationary buffers as well as for those of moving vehicles. The piston in some cases may be moveable, and the water and air chamber stationary, and the whole apparatus may be mounted if desirable upon an "independent buffer carriage."

[*Printed, 1s. 1d. Drawings.*]

A.D. 1845, April 7.—No. 10,595.

METCALFE, THOMAS. — Velocipedes. This velocipede is mounted on three wheels, the single wheel in front being also used for steering. This wheel is carried in a fork and is provided with springs. It is worked by a hand lever in the ordinary way. The propulsion is effected by means of a tread wheel, the foot boards of which may be made to slide radially so as to increase or decrease leverage. The propelling power is communicated to the wheels by means of pitch chains and pulleys or by toothed gearing. Speed may be varied by changing the gearing and a brake is fitted to one of the pulleys, which may be made to act by hand or by the foot. The velocipede may be made to carry two persons.

[*Printed, 6d. Drawing.*]

A.D. 1845, April 7.—No. 10,601.

BURY, EDWARD. — "Certain improvements in locomotive engines, carriages, or waggons running upon railways or common roads for the prevention of accidents."

[*No Specification enrolled.*]

A.D. 1845, April 29.—No. 10,640.

WILSON, WILLIAM GILMOUR.—"Improvements in the construction of wheels for carriages."

According to this invention the nave or centre of a carriage wheel is formed of plates fastened together by ordinary means, "or it may be cast in one or more pieces." "The outside is kept close, so that neither the bush nor the end of the axle comes through to the outside." On the inner side of the

nave or centre is a snugg or flange, by means of which a plate is fastened to the nave, and presses against a collar on the axle, so as to keep the latter within the nave and bush. The details of the invention are very fully set forth, the patentee claiming particularly, as of his invention, a mode which is described of "forming the hollow rim or felloe of a wheel by means of wrought iron or other rolled metal," a mode of fixing the spokes to the nave and to the rim or felloe by means of sockets; and the mode of forming the nave or centre already alluded to.

[*Printed, 11d. Drawing.*]

A.D. 1845, May 8.—No. 10,660.

BEAUMONT, GEORGE DUCKETT BARBER. — Propelling carriages. For this purpose there is substituted for the wheel a series of radial arms or spokes each having at its end a shoe or block, which is capable of some lateral play as well as some movement longitudinally on the spoke. Various methods of socketting these shoes are shown. Friction wheels supported by an independent frame run on these blocks or shoes, and the series of blocks is driven by means of a toothed wheel running on them and worked by a pinion on the driving shaft. When the roads are good a series of blocks, chained together and running over a fixed frame may be used. Where depressions occur in a road the blocks are guided over them by means of a shelf on the frame to take projections or pins on the shoes.

[*Printed, 6d. Drawing.*]

A.D. 1845, June 10.—No. 10,717.

SMITH, THOMAS.—"Improvements in suspending carriages, and in the construction of wheels for carriages."

This invention relates in the first place to certain modes of arranging the parts of two-wheeled carriages, so that when the horse falls, or otherwise the points of the shafts are brought to the ground, "the bodies of such carriages may preserve their horizontal position."

An arrangement is described in which the shafts of a two-wheeled vehicle are supported by springs resting upon the axle, as usual, but the shafts have affixed to them upright



arms, curved at the upper parts, and the body of the vehicle is suspended from the curved parts of these arms by means of links, the result being that on the ends of the shafts coming to the ground in case of accident the links preserve the body of the vehicle in a horizontal position. Instead of links, straps or chains may be used, and to one of the shafts a prop is jointed, which prop, when the body of the vehicle is thrown forward, assumes a perpendicular position, and prevents the vehicle from falling forward. According to another arrangement the body of the vehicle is supported on springs, each spring having a collar by which it is connected with an axis, in such manner that it may turn thereon. To the front part of the body are affixed arms which project downwards, these arms, when the shafts are lowered from the horizontal position, coming to the ground and supporting the body still in a horizontal position. These arms may also serve to protect persons getting into the vehicle from the dirt on the wheels. When the shafts are again raised into the horizontal position a certain cord, chain, or spring, returns the body of the vehicle to its first position.

Another part of the invention relates to the wheels of carriages. In one arrangement the spokes are of metal, formed with a screw at each end. The felloe is of metal, bent into a trough-like form, the open part being outwards, and being filled with pieces of wood and surrounded by a tire, the arrangement being such that the spokes are screwed both into the felloe and tire and also into the boss or nave of the wheel; such boss or nave being either of wood or metal, according to circumstances. In another case each spoke, which may here be of wood, has an enlarged end next the boss of the wheel, over which is placed a socket which is secured to the boss by screws, the felloe being also secured to the spokes by screws; collars or ferrules preventing the spokes when of wood from being split by the screws. Several other arrangements of wheels are set forth, flanged felloes, pins, rings of metal, and other details being employed in securing the parts of such wheels together.

[*Printed, 11d. Drawings.*]

A.D. 1845, July 3.—No. 10,750.

WALKER, THOMAS, and MILLS, GEORGE. — “Certain improvements in springs and elastic power, as applicable to railway carriages and other vehicles, or to any other articles or purposes for which springs or elastic power is now used.”

According to one modification of this invention air-tight bags, filled with air or gas, are enclosed in cylinders, and pistons are arranged in such cylinders so as to act upon and compress such bags and the air or gas within them, the buffer heads being attached to the rods of such pistons. In other modifications of the invention springs are substituted for bags of air or gas, one “important part” of this invention being mentioned as the combination of atmospheric air with confined spiral springs. Various combinations of the mechanism mentioned are described, the mode of applying ammoniacal gas as well as atmospheric air being fully set forth.

[*Printed, 7d. Drawing.*]

A.D. 1845, July 29.—No. 10,789.

BEADON, GEORGE.—Propelling carriages. — This invention relates to propelling ships and to other matters. It comprises also a method of creating adhesion in belt pulleys and in land and other propulsion. The main pulley has a hollow periphery with a rim pierced with small holes. The periphery is divided into compartments, each communicating with a hollow spoke through which the air is exhausted when the belt comes upon that section of the periphery. Thus pressure of the atmosphere increases the adhesion.

It also relates to a method of propulsion by means of certain substitutes for the ordinary wheels. These are spirals mounted on cranked axles and having small wheels or rollers inserted at intervals along their bearing edges. A drum may be used instead of the spiral provided the wheels or rollers be fitted to it in a spiral line. The axis of the spiral or drum is in the line of progression.

[*Printed, 2s. Drawings.*]

A.D. 1845, August 7.—No. 10,808.

SMITH, HENRY.—“Improvements in the manufacture of “ wheels for railways, and in springs for railway and other “ carriages, and in axle guards for railway carriages.”

With the exception of the following parts, the improvements comprised by this invention are specifically claimed for application to railway purposes. These parts are :—

Firstly. A mode of shrinking tyres “on to wheels with “ greater truth,” which consists in first forcing the wheels into certain “cones” before receiving the tyres, and again forcing them into a similar but larger cone after the tires have been shrunk thereon.

Secondly. Another mode of effecting the same object by the use of moveable segments actuated by excentrics or by other similar means.

Thirdly. Certain modes of bending the plates of metal intended for the springs of railway and other carriages, one of which consists in the use of a plate carrying moveable stops in concert with a second plate carrying moveable bars, such stop and bars being arranged in any desired curve, and the plates being pressed between them ; while another mode consists in the use of grooved rollers regulated by means of screws and stops.

By disclaimer and memorandum of alteration dated 22 Jan. 1855, No. 10808\*, the patentee struck out from the title the words “and in springs for railway and other carriages, and “in axle guards for railway carriages,” and disclaimed so much of the invention as related to such part so struck out.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1845, October 6.—No. 10,852.

MOREAU, GABRIEL HIPPOLYTE.—“An improved steam carriage.”

[*No Specification enrolled.*]

A.D. 1845, November 18.—No. 10,948.

POOLE, MOSES.—Carts for transporting earth. The cart described in this specification is intended to be used with the inventor’s apparatus for excavating and raising the excavated earth to the tipping bank. The cart has two wheels of about three feet five inches in diameter. The back part of the framing is higher and wider than the front in order to allow of a large opening through which the contents may be dis-

charged. It is intended to be moved by two men and when it is to be emptied, the workman pulls a cord which raises the backboard and so allows the contents to be tipped out. There is consequently no necessity for removing the tail board.

[*Printed, 10d. Drawing.*]

A.D. 1845, November 18.—No. 10,957.

POWELL, HENRY BUCKWORTH.—“ Certain improvements in “ carriages to be used on rail and other roads.”

This invention has for its objects the facilitation of transport by means of a wagon body which can be transferred from one carriage to another without unloading. This body is slid by means of friction wheels and guide rails on to the carriage upon which it is to be moved from place to place, and it may be transferred from this carriage to another, either for railway or road travelling, as may be desired. A drum and tackle fitted to the carriage assists the placing in position of the body and a jack is provided for use in those cases where two carriages may be of different levels to raise one or the other to such a position as to permit the transfer of the load.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1845, November 20.—No. 10,959.

HUNNYBUN, THOMAS, and VENDEN, EDWARD.—“ Improvements in that description of passenger carriages called “ omnibuses.”

The object of this invention is, “ the so constructing omnibuses that the bodies thereof may be brought so near the “ ground that no step is required for passengers ” when entering such omnibuses.

The first part of this invention consists in forming recesses in the body of the vehicle, on each side, for the reception of the axle of the hind wheels, and also rounding off or narrowing the body at the fore part thereof, the patentees stating that by these means, aided by the placing of the perch bolt considerably behind the fore axletree, they are enabled to have comparatively large fore wheels. Both the fore and hind axletrees are deeply cranked, and on the axletrees are forged lugs, on which certain blocks are placed, the springs of the vehicle resting upon these blocks, and being secured in position by means of certain plates, clips, and screws. The hinder parts

of the back springs are connected with scroll irons, fixed to the body of the omnibus, while the fore parts of such springs are connected with eyes affixed to such body, the patentees stating that by this arrangement the shocks from the wheels and the weight of the body will be received on the springs, comparatively little strain being thrown upon the vertical parts of the axles, which might otherwise cause them to bend towards each other.

[*Printed, 9d. Drawings.*]

A.D. 1845, December 10.—No. 10,990.

THOMSON, ROBERT WILLIAM.—Elastic tires. This invention consists in fitting wheels with tires made of some elastic material and inflated with air. The tire and felloe “are made  
“ much broader than usual and project considerably at both  
“ sides beyond the supporting spokes.” “The elastic belt is  
“ made as follows:—A number of folds of canvas saturated  
“ and covered on both sides with india rubber or gutta percha  
“ in a state of solution, are laid one upon the other, and each  
“ fold connected to the one immediately below it by a solution of india or gutta percha, or other suitable cement.  
“ The belt thus formed is then sulphurised by immersion in  
“ melted sulphur or exposure to the fumes of burning sulphur  
“ which renders it more pliable and prevents it getting stiff  
“ on exposure to cold; or the belt may be made of a single  
“ thickness of india-rubber or gutta-percha, in a sheet state  
“ and sulphurised, as aforesaid, and then enclosed in a canvas  
“ cover. A strong outer casing in which to hold the elastic  
“ belt, is then built up (so to speak) around the tire by riveting together a series of circular segments of leather and  
“ bolting them to the tire. The segments at two of their  
“ edges are made to overlap each other, as shewn, and then  
“ secured in their place by passing bolts through the tire and  
“ felly and making them fast by nuts. The elastic belt is  
“ then laid upon the portion of the segments thus made fast  
“ to the tire and secured in its place by bringing the two  
“ remaining and as yet unjoined edges of the segments  
“ together over the casing, and connecting them together by  
“ rivets. A pipe through which to inflate the elastic belt  
“ with air, is passed at one place through the tire of the  
“ wheel, and fitted with an air-tight screw cap.” “If the

“ elastic belt were first stuffed with horse hair or sponge, or  
“ other elastic materials, and then inflated by blowing in air  
“ to a high degree of tension, the belt would be less liable to  
“ be cut by concussion between the tire of the wheel and the  
“ roadway. Instead also of the elastic belt being made in  
“ either of the modes aforesaid, it might be formed of a  
“ number of separate tubes, of smaller dimensions, clustered  
“ together and enclosed within a leather cover.” “ Any undue displacement of the air at the bearing points of the  
“ wheel may be prevented by tying the tubes across at distances of two or three feet apart, so that each tube shall be  
“ divided into a number of separate air-tight compartments.  
“ Or, instead of any of the preceding modes of construction,  
“ the belt may be formed of separate and distinct sections,  
“ each section having its own air-pipe.”

[*Printed, 1s. Drawing.*]

A.D. 1845, December 10.—No. 10,998.

ALLIER, THOMAS VICTOR.—Brakes for “ railway and other  
“ carriages.”

According to one mode of carrying out this invention a lever is provided, by means of which the engine driver may bring the retarding apparatus into action at pleasure, this lever being connected, by means of a link, with a chain and a sliding bar and other apparatus in combination therewith, and by which certain other levers having holes in them are brought into contact with toothed wheels fixed on the axles of the carriage; these wheels then not only restraining the axles and bearing wheels from revolving but being brought down into such a position that their lower ends, which are serrated, are forced into contact with the ground. The boss of the lever mentioned above is furnished with ratchet teeth and a click acts upon these teeth when the apparatus is brought into operation and retains the parts in the position into which they have been brought, until released therefrom by turning a winch, which is connected with mechanism for removing the click from the ratchet teeth and otherwise restoring the parts into their first situations.

According to other modifications of the invention, mechanism of somewhat similar character to that mentioned above is used, in conjunction with apparatus by which “ pressers ” or

brakes may be applied to the running wheels certain projections on the axles of the carriages (for example) being made to act upon certain hooks, rings, and chains, and so not only press the brake blocks against the wheel but act upon certain springs by which the resistance to the progress of the carriage is increased. The details of the invention are very fully set forth.

[*Printed, 8d. Drawings.*]

A.D. 1846, January 12.—No. 11,031.

CHINNOCK, CHARLES.—Windows. A box or tube is fitted in the framework of the door, in which is placed a spiral spring. To the window sash is fitted a piston, by which, when the window is lowered, the spring is compressed. A catch engaging with a rack, holds the window in its place and when released the window can be adjusted at any height by the upward action of the spring. A strip of india rubber may be substituted for the spring. In that case the strip is secured by one end to the top of the box or tube and by the other to the bottom of the piston.

The Specification relates to many other subjects.

[*Printed, 3s. Drawings.*]

A.D. 1846, January 20.—No. 11,048.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—"Certain improvements in railway and common road carriages."

[*No Specification enrolled.*]

A.D. 1846, March 18.—No. 11,135.

HANCOCK, THOMAS.—Treatment of caoutchouc. This invention relates to the manufacture, by moulding or embossing processes, of various articles of vulcanised india rubber; and the patentee refers to his previous patents of No. 9952, A.D. 1843, and No. 7344, A.D. 1837. Among other matters included the following have reference to the present series:—

Obtaining the greatest amount of elasticity from india rubber for carriage springs, by forming the material in cylinders or corrugated sheets, and before vulcanising, building them up and cementing them together at angles so as to leave

as much space between each as to admit of the free action of the surfaces when compressed.

The use of hollow chambers, made by casting india rubber in moulds and then vulcanising, for springs and for stuffing seats and cushions. In some cases, to provide against accidental rupture, several are enclosed one within another.

For carriage linings and cushions, &c. cylindrical air chambers are enclosed in cloth or leather cases divided into compartments to receive them.

Combining with caoutchouc, pitch, resin, wood, or cork dust or fibrous substances and making therefrom imitation lace and fringe for coach linings, &c.

[*Printed, 4d. No Drawings.*]

A.D. 1846, March 25.—No. 11,151.

TAYLER, JOSEPH NEEDHAM.—Framing for carriages. This invention relates chiefly to a method of propelling vessels, but it includes also the construction of carriage or truck bodies with two frames, one over the other, with an elastic bed between them to prevent vibration. This principle is said to be particularly applicable to carriages for public conveyance which have to carry heavy loads, such as omnibuses.

A method of stopping and disengaging carriages is also described, but it is claimed as applicable “for railways only” and it does not, therefore, come within the scope of this series.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1846, May 5.—No. 11,191.

PALLISER, GEORGE.—“Improvements in the construction of “outside seats of carriages.”

This invention, to which the patentee gives the name of the “Protean Rumble,” consists “in so constructing the back seat or the driving seat of any carriage that it may be folded up into a compact form and used otherwise than as a seat.” This, box, which is made by preference chiefly of wood, may, when required, be easily removed altogether from the carriage, or it may be placed at the back of the carriage in a vertical position, for the protection of the back of the carriage, in place of what is commonly called an opera



board, or it may be let down into a horizontal position, forming a footman's or luggage board.

The invention is set forth at some length, and illustrated by a drawing containing between thirty and forty figures, which it will be necessary to examine in order to understand the details of the invention. These details include various hooks, spring bolts, sliding straps, bell cranks, elbow levers, and other mechanism. One arrangement is described in which, when the improved seat is used as a driving seat, a part of the dashing board is capable of removal so as to admit of the seat, and then forms a dashing board to such seat, being secured in position either by sockets or screws, or otherwise.

[*Printed, 10d. Drawing.*]

A.D. 1846, June 2.—No. 11,232.

VON USTER, HENRY LAWRENCE TOBIAS TSCHUDY.—“Improvements in apparatus or machinery for measuring and indicating the distance travelled by wheel carriages.”

In this invention there is affixed to the inner part of the nave or boss of one of the carriage wheels a snail, which, by its rotation with the carriage wheel causes rotation also of a toothed wheel with which it is in gear, the latter communicating motion, through the medium of bevel wheels, universal joints, and a revolving shaft supported by bearings connected to the carriage axle to a small axis on which is a screw wheel or worm, the latter, again, giving motion to a wheel and a vertical axis on which it is fixed, and thereby to some suitable arrangement of wheelwork for registering the distance travelled. The registering apparatus may be variously arranged, and may be placed either inside or outside of the vehicle, the patentee stating, however, that he prefers an index with two faces, one of which should be placed so as to be readily examined from the interior of the vehicle, and the other be placed outside for the convenience of the driver. The shaft supported by the carriage axle, as mentioned above, is in two parts, one capable of sliding within the other, this arrangement, along with the universal joints, preventing the working of the apparatus from being affected by the movement of the body of the carriage on the springs. If desired the screw wheel may be attached to the framing of the

vehicle, and a stop or clutch movement be arranged in connection with the boss or nave of the carriage wheel, instead of the arrangement mentioned above.

[*Printed, 9d. Drawing.*]

A.D. 1846, June 29.—No. 11,273.

ANDERSON, Sir JAMES CALEB.—Propelling carriages, &c. The first part of this invention relates to what the patentee calls a “power wheel.” It consists of a wheel having inside its periphery a number of water cylinders, the piston rods of opposite cylinders being connected and each pair of opposite cylinders having also connecting pipes. Cams and friction rollers act on the cross heads of the piston rods in such a manner that the water is transferred from one cylinder to another so that the cylinders on the descending side of the wheel are kept constantly full and the preponderance is therefore maintained on that side. This wheel has therefore a better “bite” on the road. Another form of wheel is described, in which the power of a vacuum is used to effect the transfer of water.

Another part relates to a method of propelling a steam carriage. A pair of oscillating engines acts on a crank shaft carrying one of these power wheels, which being enclosed in a casing, is also made to act as a blower to the furnace. On the end of the crank shaft is another crank from which a connecting rod passes to a crank on the driving wheel axle. “As the power wheel is equal in diameter to the propelling wheels of the carriage, it will in equal times go through the same space as the propelling wheel, and the power being transmitted to the propelling wheels by the connecting rods, it will be clear that any weight applied to the periphery of the power wheel will produce the same tractive effect as if applied to the periphery of the propelling wheels.”

Another improvement consists in attaching the carriages of a series to each other and to the locomotive. They are connected “by poles having at the hinder end a pin which works in a slotted frame attached to the succeeding carriage.” By this arrangement each carriage is started in its turn. On the hind axle of each carriage a power wheel

is fitted and a steering apparatus is placed on the second of two carriages.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1846, July 27.—No. 11,314.

HEATH, ROBERT.—Wheels. The invention is described in its application to railway purposes, but its application to common roads is expressly claimed.

This invention consists in a peculiar formation of wheels “in connection with the particular relative proportions of the different parts of the same, whereby the contraction consequent upon the cooling of the metal in casting is caused (instead of weakening the wheel) to bind the whole together in one solid mass.” The arms may be either flat, round, or of any other shape, “but of the same sectional thickness at the rim as at the boss, without any flanges or ribs, so that the arms shall not contract more or sooner at one place than another,” the wheels being formed by preference, “with an uneven number of arms, so as to assist the contraction of the rim, that is having each arm opposite to the space between the two opposing arms,” and the rim and the boss being each “three times the strength of the arms or thereabouts.”

[*Printed, 6d. Drawing.*]

A.D. 1846, July 30.—No. 11,318.

MALLET, ROBERT, and DAWSON, JOHN SOMERS.—(*Partly a communication.*)—Axle boxes, &c. This invention relates partly to certain improvements connected with railway rolling stock and also to a method of transferring common road carriages from trucks to the ground and vice versâ, by means of a kind of travelling overhead winch.

Another part of the invention consists in the employment, for the purpose of lubricating the journals of the axles of locomotive engines and railway carriages, and all other sorts of revolving and rubbing cylindrical surfaces, “of a vessel of oil or other fluid unguent, having floating on the surface thereof a ball or sphere or balls or spheres, or other suitably shaped body or bodies” for the purpose of applying the said unguents.

Another part of the invention consists in using for the journals of locomotive and other revolving axles and shafts, compound bearings, “formed partly of agate or flint, or other “natural stone or mineral, or of glass, porcelain, stoneware, “or other like artificial composition, and partly of metal or “metals.”

The other parts of the invention do not require notice here.

[*Printed, 2s. 3d. Drawings.*]

A.D. 1846, August 15.—No. 11,336.

AITKEN, WILLIAM.—“Certain improvements in two & four “wheeled carriages.”

This invention consists, firstly of certain improved combinations of materials to be employed in the formation of the body parts of two and four-wheeled carriages, the object being to increase the strength of such parts while rendering them lighter than those usually constructed. The framework is composed of outer parts of iron combined with inner parts or linings of wood. The iron is of three different forms, the first being angle iron, the second of the **U**-form, and the third of the flanged **U**-form; and these may be used in various ways and combined with panels composed of iron plates. If desired the flanged **U**-form of iron may be used without the wood filling and the panels may be connected with the flanges. The ironwork is japanned either before or after the parts are put together, the customary process of painting being thus avoided.

Another part of the invention consists of certain improved spring bearings for carriages. Each of these bearings is composed essentially of a bar or plate which is placed under the carriage body or frame, and has projecting downwards from it two tubes these passing through eyes in a shackle bar, in which they are free to move up and down, there being placed around each tube two helical springs, one above the other, the upper being lighter and more compressible than the lower spring and each spring being surrounded by an outer tube, one of which slides within the other as the springs are acted upon.

Another part of the invention relates to the construction of

the wheels of carriages. In one case a nave is provided with a bush which is either cast upon a mandril for the purpose of hardening the rubbing parts, or cast soft and then bored out and case-hardened. This nave is furnished with recesses for oil for the lubrication of the axle such oil being admitted through a suitable orifice, and flange plates of a "saucer" form are shrunk upon the nave, a tube of malleable iron being also shrunk upon the inner end of the bush, and projecting beyond it, the projecting portion being screwed inside for the purpose of receiving the screwed end of a brass nut which is made in two halves, an elastic washer having been previously inserted into the bush for the purpose of rendering the latter oil-tight; another nut and washer serving the same office at the outer end of the axle. The felloe is formed of a combination of U-iron and wood and is then connected with the nave by means of spokes, each of which is formed of two rods of iron, the lower ends of which are passed through the flanges of the saucer-shaped pieces on the nave, and secured by nuts, while at the upper ends the rods are welded together, forming a single piece which is passed through both the iron and wood of the felloe, and secured by nuts which are sunk into the wood. An iron tire is then placed upon the felloe in the usual manner.

In another modification of this part of the invention the iron tire and wooden part of the felloe are dispensed with, and a tire of sea-horse leather, gutta percha, or sulphurized caoutchouc placed round the wheel, the latter being thus rendered "noiseless."

Another part of the invention relates to the construction of a compound axle for carriages, which is composed in the first place of an oblong plate of iron so bent and welded at one end as to form a tube, this being turned up and serving as one arm of the axle, and furnished with a screw by which it is ultimately secured to the wheel, the other part of the plate being bent into the U-form. A second plate is then treated in a similar manner and the two placed together, pieces of wood being first inserted between them, the outer ends of which fit into the "arm parts" of the axle, while the other parts are scarfed on one side so that the two fit together inside the U-shaped parts of the metal a flat plate being also

inserted between the edges of the U-shaped metal, and the whole being united together by rivets.

[*Printed, 10d. Drawing.*]

A.D. 1846, August 25.—No. 11,348.

BISHOP, JAMES, and WOOD, THOMAS.—“Improvements in “passenger carriages.”

This invention relates to omnibuses, and consists in the first place in arrangements which enable persons riding therein more able to see external objects, and at the same time be more conveniently seated than by the present arrangement of such vehicles. And the invention also relates to a novel arrangement of the external seats, and of the means of obtaining access to such seats.

An omnibus is described, the front of which is almost entirely open, but furnished with sliding frames containing glass, the driver's seat and footboard being raised higher than usual, so as not to obstruct the view of the passengers through the front of the vehicle, the seats for the passengers being placed across the vehicle, but not extending quite from one side to the other, a passage being left at each side, and access being obtained to the seats by means of these passages, and doors in the sides of the omnibuses. The external seats are also placed across the vehicle, access to the first of these being obtained by ascending the steps which lead to the driver's seat, and then passing over that seat, but access to the others being obtained by means of a series of steps at the back of the vehicle, a hand rail being so arranged as to assist persons in ascending and descending.

[*Printed, 1s. Drawings.*]

A.D. 1846, August 29.—No. 11,357.

BOYDELL, JAMES.—Facilitating draught of carriages. The patentee says “my invention consists of a mode of applying “moveable detached parts of a railway to the wheels of carriages, whereby each part is successively placed by its wheel “in the road or land over which the carriage is to pass, each “piece of the railway, when down, allowing its wheel to roll “over it, and the wheel lifts the pieces of railway succes-

“ sively and holds each piece in such position as to deposit it  
“ correctly when that part of the wheel which carries a part  
“ of the railway again comes near the earth, by which means  
“ a railway will continuously be formed and broken up as the  
“ carriage is drawn along a road or over land, by which the  
“ power required to draw a given load will be reduced.”

The rails are attached to the wheels by means of pins working in curved slots on the wheels. The latter may be of iron if preferred.

[*Printed, 6d. Drawing.*]

A.D. 1846, September 17.—No. 11,371.

DAVIES, DAVID.—(*A communication.*)—“ Certain improvements in steps for carriages and other purposes.”

This invention consists in supporting the step or steps of a carriage upon a framework, “ or geometrical system of levers, “ so arranged and disposed that on giving motion to a central shaft the step or steps may be raised or lowered at “ pleasure.”

An arrangement is described in which the body of a carriage is provided underneath, at each side, with a quadrangular box or frame for the reception of the step and its supporting levers when closed up. Two bars or levers are jointed to the frame of the carriage, below the framing of the door, two other similar bars or levers being placed upon a square shaft mounted in bearings below the carriage frame, at some distance behind the first bars, these four bars supporting at their lower ends two horizontal bars on the front portions of which is mounted the carriage step. On one end of the square shaft is a lever, which stands at right angles to the four bars or levers already mentioned, and at the outer end of the lever there is a short connecting piece which is jointed to the forked end of a link bar, and on the carriage door is a metal step piece, which is jointed by a right-angled connecting link to the outer end of the link bar. The result of these arrangements is that when the carriage door is shut the four bars or levers are so turned backwards and upwards as to place the step within the quadrangular box or frame under the carriage, while on the door being opened the bars or levers are turned downwards and brought forward so as to bring the step of the carriage into a proper position for use. In order to keep the

step firm in its position when either up or down a strong steel spring is so arranged as to press upon one or other of the sides of the square shaft, according to the position of the parts; or instead of one spring two may be used, one above and one below the shaft. By an extension of the arrangement of levers more than one step may be actuated. In carriages which have no doors the apparatus may be worked by hand, and the invention may be used where it is desirable to form a communication from the door of a house to a yard or garden on a lower level, and in many other cases.

[*Printed, 9d. Drawing.*]

A.D. 1846, September 17.—No. 11,373.

WRIGG, HENRY. — (*Partly a communication.*) — Diminishing draught and friction. The carriage described in this specification has, attached to its framing, a set of rails which rest or move on a series of friction wheels or rollers, each mounted and capable of revolution on a block or foot, the whole being linked together into an endless chain. As the carriage is progressed by steam or other power this endless chain of blocks and friction wheels passes round the frame to which the rails are secured and the latter slide over the friction wheels. The blocks are of wood shod with iron and furnished with felt packing to deaden concussion. The bearings of the friction wheels are provided with closed lubricating cups, from which oil is taken by a cotton wick. The carriage is steered by means of a single set of the above apparatus used as a steering wheel and placed in front of the vehicle.

[*Printed, 1s. Drawings.*]

A.D. 1846, November 3.—No. 11,433.

EDDY, GEORGE W.—Wheels. “This invention consists in a  
“ new and improved mode of constructing or forming a cast  
“ metal wheel (for railway cars or other purposes) by which  
“ the said wheel may be founded or cast with a cold chilled  
“ tread or rim, and with little or no danger of breaking or  
“ cracking, or being liable to afterwards break or crack, by  
“ reason of strains such as usually generated within it while  
“ being made or founded according to any of the forms or  
“ modes heretofore usually adopted in the manufacture of



“such wheels.” The wheel is composed of a cast metal rim and hub, united together by two cast metal plates, “the union of the same being effected by casting or founding the whole in one piece at one and the same time, and in a mould prepared with or having an iron or metal chill or ring properly adapted to it, so as to suddenly cold chill or harden the periphery or tread of the wheel during the operation of casting or founding it.”

One of the plates thus used is of “undulating” form, the other being concave or convex; but two undulating plates may be used, the patentee stating that such plates will readily yield to the contraction of the rim, and that he claims the use of such plates even when combined with a rim and a hub which may be separated or divided transversly into two parts, the separation taking place between the two plates.

[*Printed, 7d. Drawing.*]

A.D. 1846, November 3.—No. 11,435.

EXALL, WILLIAM.—Wheels. This invention relates to the following improvements:—A lathe for shaping spokes, the work being done by means of fly cutters regulated by a model spoke.

An arrangement of two pairs of circular saws acting at right angles to each other, between which the ends of the spokes are brought regularly in succession for the purpose of having the tenons cut.

An endless band saw for cutting the felloes which are guided by a frame or by hand, a guide frame being also used for the purpose of cutting the ends radially. For turning and facing the felloes they are secured by set screws in a ring which is put into a lathe. The felloes may be morticed for the spokes while held in this ring by means of a drill advanced from the centre.

A method of morticing the nave. Two kinds of tool for this purpose are described. Where the mortices are to have circular ends revolving cutters combined with plane cutters are used. Where square-ended mortices are required, two morticing chisels are to be used which are caused to separate from each other as they progress.

Making cast metal naves. Each nave is cast in two parts,

that which receives the spokes constituting the outer part which is held upon the axle by being connected with a back plate within which works a collar formed on the axle. The apertures in that part which receives the spokes are wedge-shaped, the ends of the spokes being of a corresponding form and the outer part of the nave has a central box or hollow neck projecting from it, within which the axle works, this projecting portion forming an oil box.

A method of fixing the spokes and dowels of wheels by compressing the dowels and spoke ends in dies and presses previous to their insertion in place, so that by expansion after insertion they may be retained.

A tyre having lateral flanges to embrace the felloes. One flange may be any required depth; the other must be of such depth as to allow it to be put over the wheel when expanded by heat and that when contracted by becoming cold it will clip the felloes.

Rolling tyres. A coil of thin metal is first formed by winding (for example) a length of iron hoop, coil by coil, one close over the other, securing the ends and welding the mass. The ring thus formed is then placed hot between rolls, having upon them such flanges, grooves or mouldings as may be necessary to bring the whole into the form of tyre desired. Previous to this operation the ring is of less diameter than the proposed tyre, and is increased in diameter by the rolling process, and before this process is complete certain guide rollers are introduced within the ring, these being mounted in bearings carried by screws, and radiating from a central axle, certain bevel wheels being so arranged that the screws may be turned simultaneously and so press the rollers against the interior of the tyre. "In this manner tyres for wheels for railway and other carriages may be finished sufficiently true at once."

[*Printed, 1s. 2d. Drawings.*]

A.D. 1846, November 5.—No. 11,442.

MABERLY, FREDERICK HERBERT, BRANWHITE, THOMAS, and LUSHER, DENNIS.—Wheels, brakes and propelling. The first part of this invention relates to an improved form of wheel designed for safety and for less resistance to the air. The inner part of the tire is furnished with a flange through

which pass the bolts used for securing the plates of iron or wood which form the body of the wheel. The nave is made in halves which are bolted together.

The brakes in some cases are actuated through the medium of levers and connecting rods; in others by means of a rod carrying "irregular pieces" which act as cams; in others by inclined planes; and in some cases such brakes are so arranged as to act as "shoe brakes." Other brakes, applicable to the wheels of carriages, are also described, as likewise modes of bringing them into action through the medium of wedges, springs, bars, chains, and other suitable apparatus. There is also described a system of continuous train brakes.

The invention also comprises a system of spring propulsion. Several springs are arranged in a box in such manner that "the eyes of the springs nearest the middle are less than those nearest the outside, so that each may easily be wound up separately." The method of application to rail and tramways is described.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1846, November 12.—No. 11,445.

ADAMS, WILLIAM BRIDGES.—Carriages. This invention comprises many improvements relating to both railway and common road carriages. Such as relate to the latter are as follows:—

Improvements in omnibuses, such as placing the perch bolt behind the front axle to admit of large front wheels being used; raising the central part of the roof to afford head room and to furnish seats for outside passengers; the application of a brake, worked by the foot of the driver or conductor or a hand lever, to the hind wheels and the use of a buffer or shield at the end of the pole.

Improvements in plate springs, including an arrangement in which the several plates are pressed with a bend about the mid-length where the fastening clips are applied, having the rest of the plate straight. Two springs of this kind may be combined. Plates of steel thickest in the middle are also used for such springs convex on one side and concave on the other. This arrangement dispenses with slots and studs for keeping the plates together. Bow springs are described as being

formed of two plates instead of one as usual. Disc springs are described as concave and having a hole in the centre and radial slots, being then passed upon a rod in any suitable number.

Wheels with the greatest breadth of the wood of the spokes in the direction from back to front of the wheel in order to give elasticity.

Using corrugated metal panels for carriage bodies. Applying disc springs within carriage cushions "in order to give " ease of motion."

[*Printed, 2s. Drawings.*]

A.D. 1846, November 19.—No. 11,455.

BROCKEDON, WILLIAM, and HANCOCK, THOMAS.—"Im-  
"provements in the manufacture of articles where india-  
"rubber or gutta percha is used."

This invention consists in "peculiar means of applying these  
"substances to a variety of purposes to which they have not  
"heretofore been so applied, by means of the processes  
"described in the Specification of a patent granted to Mr.  
"Alexander Parkes, No. 11,147, A.D. 1846, entitled 'Im-  
"provements in the preparation of certain vegetable  
"and animal substances and in certain combinations of  
"the same substances alone or with other matters.' The  
"processes enumerated in this patent produce certain changes  
"in the qualities of caoutchouc and gutta percha, some of  
"them similar to those produced by sulphur and heat in the  
"process now termed 'vulcanising' in others purifying &  
"colouring those substances, and by these means rendering  
"them suitable to a great variety of purposes."

The specification of this invention is of great length, and is extremely vague and diffuse, the patents of Thomas Hancock, No. 7344, A.D. 1837, No. 7549, A.D. 1838, No. 9952, A.D. 1843, and No. 11,135, A.D. 1846, being referred to as well as the patent of Alexander Parkes already mentioned. The particulars which constitute the present invention are not specially pointed out but one part of the invention would seem to consist in rendering cloth, silk and other "manufactured" fabrics waterproof in place of operating upon the raw materials of such fabrics before manufacture, as practised under Parkes's and Hancock's inventions, such fabrics being

rendered waterproof by immersion in the "changing solvents," but being protected from injury during the process by being coated with glue, size, or an aqueous solution of lac, which is afterwards removed by the use of an alkaline solution. Printed or dyed fabrics which require to be coated on one side only have the selvages joined together the seam being rendered waterproof, and are then immersed in "this bag-like form," and the effect of the changing solvent upon any particular part of the fabric immersed may be prevented by the application thereto of size or the solution of lac. Manufactured fabrics may thus be coated or united together in two or more thicknesses and this part of the invention may be applied to a variety of purposes, such as the formation of cloaks and other articles of dress, "carriage roofs, seats, and linings," cushions, pads and other objects. Where the fabrics require to be seamed or sewed together the junction may be rendered waterproof by the application thereto of the solvent with a brush. Articles requiring to be inflated, such as air cushions, may have their linings rendered waterproof by pouring into them a quantity of the solvent. Articles intended to contain air, water, or other fluids may be formed of caoutchouc, gutta percha or a mixture of the two and then immersed in the "changing solvent," and any of the articles mentioned above may likewise be thus formed, gritty or colouring matters and fibrous substances being united with the other materials if requisite, the compound being first made into sheets, and the article required then shaped or otherwise produced therefrom; washers for water, steam and other joints, hose pipes and tubing, railway valves, and other articles being among the articles thus obtained, as also "springs for carriages & railway buffers." Such sheets may also be cut up into threads and otherwise treated for a variety of purposes.

In one part of the specification the patentees mention that when an article is to be made entirely of gutta percha without the use of solvents they operate in the manner prescribed by Doctor Montgomery when he introduced the subject to the Society of Arts in the year 1843, the gutta percha being "dipped in water near boiling," when it may readily be formed before it cools to  $130^{\circ}$  or  $140^{\circ}$  in any required shape, which, it will retain at any temperature below  $110^{\circ}$ . The greater part of the specification however his reference to matters

which have no connection with the subject of the present series of abridgments.

[*Printed, 5d. No Drawings.*]

A.D. 1846, November 21.—No. 11,460.

PIDDING, WILLIAM. — Wheels, supporting carriages &c. The first part of this invention relates to a method of constructing the leading wheels of a carriage so that the latter can turn to the right or left without requiring any change of position in the axle. The felloes of these wheels do not “as  
“ in ordinary wheels, constitute an entire continuous circle of  
“ wood bound together by an iron ring or tyre, but are com-  
“ posed of detached portions of a circle corresponding to the  
“ number of spokes and not quite in contact with each other.  
“ The spokes are not fixed immovably in the nave, but are  
“ capable of a slight lateral deflection having on each side of  
“ them springs contained in recesses in the nave, which,  
“ yielding to lateral pressure, allows the spokes to be bent of  
“ the perpendicular, so as to form an acute or any obtuse angle  
“ with the axis. The spokes & the springs are retained in the  
“ nave by a hoop or ring having notches in it to receive the  
“ spokes. This ring is slid over the springs, and over  
“ shoulders formed on the spokes & is secured by another  
“ ring which is slid over the projecting ends of the first  
“ ring. Whilst the carriage is proceeding in a right line the  
“ spokes are retained in a vertical plane or at right angles to  
“ the axis by the springs; but when the power of the horses  
“ is exerted to cause it to turn, each spoke, as it comes to the  
“ ground is bent to the right or left, so that they may be  
“ considered as making a succession of diagonal steps and the  
“ front of the carriage is thereby moved in the required  
“ direction.”

The invention also relates to a means of supporting the carriage upon an endless train of small wheels, supported in links and placed transversely to the line of motion. These links carry also friction wheels to guide the whole series round a fixed frame. As the carriage is drawn forward by the horses it travels on the chain of small wheels which also revolve and allow it to move to the right or left when a force is exerted obliquely on the framing.

A carriage is also shown fitted with an endless chain of shoes upon which the wheels revolve. These shoes are fitted with springs to provide for lateral motion.

The invention further relates to a method of suspending two-wheeled carriages so that the weight of the hind part is carried before and that of the fore part behind, the axle. This is effected by cross bars or slings attached to the spring.

Finally there is shown a method of relieving the horse of the weight of the postillion in the case of a four wheel carriage by fitting the saddle on a frame carried by the shafts which are to be rigidly secured to the carriage.

[*Printed, 11d. Drawings.*]

A.D. 1846, December 14.—No. 11,487.

CARTER, JAMES.—“An improved lubricator.”

This invention is applicable in the lubrication of “bearing axles,” as well as shafts and other working surfaces of machinery.

An arrangement is described in which the axle or shaft to be lubricated has fixed upon it a worm which actuates a worm wheel fixed upon a small shaft on which is another worm which acts upon a worm wheel fixed upon a second small shaft, there being upon this another worm driving a worm wheel which turns a plug mounted in a suitable bearing carried by a box placed on the top of the cap of the axle bearing. The plug is hollow, and on the top of it is fixed an oil vessel of almost globular form, the plug, however, being provided with a midfeather, and having on each side a hole, these holes, as the plug gradually rotates, successively coming opposite certain screws, the oil then filling the spaces between the plug and the screws, and the oil in such spaces descending on the continued rotation of the plug, to the journal of the axle or shaft. The quantity of oil supplied to the journal is regulated by the position of the screws, and the speed at which the plug is caused to rotate.

[*Printed, 6d. Drawing.*]

A.D. 1847, February 24.—No. 11,594.

LOWE, JOHN, and SIMPSON, JAMES.—Springs. This invention relates to certain improvements in railway rolling stock, but another part of the invention relates to the springs of

carriages, such springs being suspended between “scroll  
“ irons” by means of links connected with rods “which  
“ vibrate upon a pin fixed in the axle box.” Different modifications of this part of the invention are described.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1847, March 3.—No. 11,606.

DUNCAN, CHARLES STEWART.—“Improvements in public  
“ vehicles.”

The invention consists, firstly, in constructing the roofs of public vehicles of glass, combined with either wood or metal framing, “and so arranging such framing that the squares  
“ of glass may be taken in and out at pleasure, and to be so  
“ arranged as to receive either one or two thicknesses of  
“ glass.”

The patentee states that if one thickness of glass is used he proposes staining and burning in permanent coloured advertisements in the inner surface of the glass, or cementing a painted or printed advertisement on a transparent medium; or when two thicknesses are used, placing a printed or painted advertisement on any transparent medium between the said two thicknesses of glass.

Secondly, in illuminating the afore-mentioned transparent roof by means of lamps, thereby rendering the advertisements readable by night.

Thirdly, in exhibiting coloured advertisements upon the side, front, or back lights of public vehicles; or placing printed or painted advertisements between two thicknesses of glass, to be used as side, back, or front lights to public vehicles.

Fourthly, in a method of covering the glass roof by night with a casing formed of metal or any other material, and lining such casing with reflectors, so as to equalise the distribution of light over the entire surface of the roof.

Fifthly, in the use of stained or painted opaque glass advertisements, to be placed in a frame suspended by the interior of the existing roofs of public vehicles.

[*Printed, 9d. Drawing.*]

A.D. 1847, March 23.—No. 11,638.

SMITH, HENRY.—“Certain improvements in machinery for  
“ cutting and separating vegetable substances; also improve-



“ ments in the construction of machines for dibbling and  
“ sowing seed and distributing vegetable substances and  
“ manure over land, part of which improvements is appli-  
“ cable to wheel carriages in general.”

One part only of this invention requires notice here, this relating to the construction of wheels adapted not only for agricultural machines but also for carriages in general. “ These wheels are composed partly of wrought iron, and  
“ partly of cast iron, and, if required, with wooden felloes.”

According to one mode of forming these wheels the spokes are composed of wrought iron elliptical tubes, that end of each tube which is to enter the nave of the wheel being slightly “ spread out,” and a plug being inserted into the outer end of each spoke, which plug is welded into the tube. A hoop of iron of semi-elliptical or angular sectional form is then rivetted to the outer ends of a series of these spokes, the latter being arranged “ so as to converge to a centre.” The portions of the wheel thus arranged are then laid upon a circular plate, and solid blocks of metal placed between the spokes so as to keep them in their places, an outer plate being then laid upon the whole, and a mould being thus formed “ with a central  
“ recess, in which the nave of the wheel is to be cast. Suitable  
“ cores are then to be placed in this recess for the purpose of  
“ forming the box or socket for the axle, and also for  
“ lightening the nave by making parts of it hollow.” “ By  
“ pouring fluid metal into this central mould, the nave of the  
“ wheel is then cast, and the central extremities of the spokes  
“ are all confined and firmly secured.” The inner ends of the blocks of metal already mentioned cause the outer surfaces of the nave to be chilled in casting, and thereby rendered hard. After removing the wheel from the mould a wooden felloe is attached to the hoop mentioned above, and a wrought iron tyre being shrunk upon that completes the wheel.

According to another modification of the invention straight bars of iron have in the first place a tenon formed at one end, and a fork or split at the other, these bars being then bent at a certain point, and the upper or bent parts being curved into segments of the intended wheel. A circular hoop is then rivetted to the curved parts of these bars, the tenon at the end of one bent portion fitting into a mortice hole in the next. The skeleton of a wheel having been thus formed is laid upon

a flat plate, with blocks between the spokes, an outer plate being used, as in the first arrangement, the nave of the wheel being then cast upon the spokes as before. In this case a wooden felloe and outer tyre may be applied if necessary, “but for light wheels these additions may be dispensed with.”

[*Printed, 2s. 3d. Drawings.*]

A.D. 1847, April 6.—No. 11,648.

STRATTON, BENJAMIN TUCKER.—Carriages, wheels, &c. This invention consists, firstly, in constructing wheels for common road carriages with spokes of corrugated or hollow iron, of any form in section, or of flat, round or oval rods of iron, or of angle or T-iron, “bent into the form of sectoral loops, the straight sides of each pair of loops lying in contact, and (preferably) rivetted or otherwise fastened together.”

Secondly, in constructing wheels for railway and common road carriages with spokes in the form of “sectoral loops of corrugated or hollow iron, of any form in its section” or of other irons as above, with “a straight radiating spoke inserted between and in contact with the straight sides of each contiguous pair of looped spokes.”

Thirdly, in lightening the iron naves of wheels by inclosing in the casting blocks of pumice stone or other suitable material.

Fourthly, in constructing the ribs or standards of carriage bodies of corrugated iron, to the flanges or edges of which the panelling of the carriage is rivetted or bolted.

Fifthly, in machinery for bending the wheel spokes above described.

[*Printed, 7d. Drawing.*]

A.D. 1847, April 8.—No. 11,649.

DE BERGUE, CHARLES, and HADDAN, JOHN COOPE.—“Improvements in wheeled carriages, and in panels and springs for carriages and other purposes.”

This invention relates in the first place to an improved mode of constructing the framework of railway carriages.

Secondly, the invention relates to an improved mode of manufacturing papier maché panels to be used for carriage

and other purposes and consists in placing a piece of papier maché intended for a panel, while in a moist state, in a suitable frame by which it may be held flat, being kept in that position until dry, and being rendered flat and even by the moist edges of the panel adhering to the frame.

Thirdly, the invention relates to the construction of steel springs for carriages and other purposes and consists in cutting the different pieces of steel of which the spring is to be composed out of plates in such a manner that the tapered or chamfered ends of the pieces are produced with little or no waste of metal, the ends of the pieces being in fact in the form of a single inclined plane, instead of being chamfered in both directions as usual.

Fourthly, the invention consists of a combination of slings, with pieces of india-rubber for the purpose of forming a side or bearing spring for a railway or other carriage. To the sole bar of the carriage are bolted two struts which project downwards, these answering as scroll irons, and each having near its lower end a box or hollow cylinder, inside which is a tube on which are placed india-rubber and metal rings, through each tube is passed a bolt which is connected with a sling or link also connected with the axle box, the bolts, when the weight of the carriage depresses the sole bar and parts in connection therewith, causing the rings of india-rubber to be compressed such rings in fact forming the springs of the carriage.

[*Printed, 2s. 2d. Drawings.*]

A.D. 1847, April 20.—No. 11,665.

ROWLEY, GEORGE WILLIAM.—“Improvements in the construction of carriages, and in apparatus to be used with omnibuses and other carriages.”

[*No Specification enrolled.*]

A.D. 1847, May 4.—No. 11,689.

TAYLOR, JOSEPH.—Wheels. The first part of this invention consists in constructing inclined flanges or snugs on the interior of the tires of such wheels, to which the inclined edges of certain plates, constituting the sides of the said wheels are attached, and also in “constructing the sides of wheels of concave plates, supported by rings or blocks of wood.”

The invention consists, secondly in a method of constructing wheels “in which the plates constituting the sides of the wheels are connected to a ring of wood, to which ring of wood the tire of the said wheel is connected.”

Thirdly, in a mode of constructing punches for cutting holes in plates for railway wheels, “that is to say punches in which two or more points only of the punches act on the plates to be cut at the same time so as to cut the said holes progressively.”

Fourthly, the invention consists in constructing a drilling machine to be used in the manufacture of wheels such as mentioned above, by combining together a number of drills so as to drill the required number of holes at the same time; this part of the invention including the use of double bands “for driving the said drills.”

[*Printed, 1s. Drawings.*]

A.D. 1847, May 22.—No. 11,706.

CHINNOCK, CHARLES.—Joints for shafts and poles. This is an improved form of ball and socket joint applicable to the above and other purposes. The ball is cast on to a shoe which is secured to the end of the shaft or pole. A cup is similarly cast on the corresponding shoe pinned to the carriage. A pin passes through the cup into the ball to which it is hinged, and is fitted with a spiral spring at the back of the cup. This spring is kept up to its work by a nut on the rear end of the pin. This spring constantly pulls the ball into the socket, by which all looseness in the joint is prevented.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1847, May 24.—No. 11,715.

ADAMS, WILLIAM BRIDGES, and RICHARDSON, ROBERT.—“Certain improvements in the construction of railways, and of engines and carriages used thereon; and also in transport and storage arrangements for the conveyance, management, and preservation of perishable articles.”

This invention relates to a multitude of particulars, and includes the application of two or four or more wheeled tenders for fuel or water, constructed with a body wherein to carry passengers or letters or parcels of goods for hire to

“ attach by a swivel joint to locomotive engines on railways.” Also, “ the application of water or steam boilers to warm the “ interior of railway carriages ;” the “ combination of gutta percha with cast iron to form a tyre or band on the buffer heads or necks of railway carriages ;” the “ application of moveable seats for passengers to railway carriages ; with “ central pivots to enter sockets in the floors.” Also a mode of constructing the tires of railway “ wheels with an internal “ rib or flange to retain their circular form at the outer edge “ of the tires to which the spokes or felloes of the wheels “ may be bolted or rivetted laterally without piercing the “ tread of the tyre,” and a mode of blocking such tires while heated to give them a true circular form. Also the application to railway wheels of “ cylindrical or circular turned wooden “ spokes and of wooden felloes, the internal portion of which “ is a straight surface, while the outer portion corresponds “ to the circle of the tyre and which are drawn together by “ bolts previous to forcing such wheel into the heated tyre “ by mechanical pressure.” Also certain modes of “ constructing bearings and axle boxes for railway wheels, so “ as to replace the bearings when worn,” “ such bearings “ being in separate pieces and fitted to axle boxes provided “ with spring metal collars or conical hoops or other flexible “ material to retain the grease or oil and prevent waste.” Also a mode of constructing “ double floors” to railway carriages for passengers and stuffing the interstice with sawdust or other similar “ substance to deaden the sounds of the “ wheels.” Also a mode of constructing close waggons “ to “ carry grain or similar substance in bulk to load near the “ top and discharge at the bottom,” and a mode of making such waggons “ of specific cubic contents internally so that “ they may serve as measures of quantity and save labour and “ expense in meterage.” Also the application of “ spring “ tension cords or chains of links,” such chains of links being “ extended by the elastic action of disc or spiral or other “ metallic springs to support carriages on their axles and “ permit lateral as well as vertical elasticity,” and certain spring frames “ for resisting the tension of the cords independently of the carriage frame.” Also a mode of enabling such spring frames “ to traverse laterally, and also diagonally

“ to the form of the carriage,” by the pressure of the flanges of the central wheels of such carriage against the rails, “ the “ movement of such wheels being regulated by elastic or “ rigid diagonal connecting rods,” and, also, the application of such diagonal rods to regulate the movement on curves of wheels attached to bow springs on railway carriages. Also the application of rollers or lubricated loose collars “ to “ prevent friction on the bearing surfaces of spiral or helical “ springs, for the purpose of elastic bearing, buffing, or “ traction to railway carriages, and the application of such “ springs to give elasticity to tension links.” Also the application to railway carriages of steel springs made in the form of hoop key rings. Also the application of the disc springs, formerly patented by the present patentee, “ within “ tubes to retain them in proper position, instead of a rod “ passing through a central hole.” Also improved modes of forming steel plates with surface hollowed longitudinally, “ so as to construct laminated springs without the use of “ slots and studs;” a mode of constructing disc springs which consists in forming them with a hole in the middle, and slits radiating therefrom.

The patentees propose to apply the various improvements described in the specification in the construction of a combined engine and carriage on one framing or wheel base. This vehicle may be made of light weight to run on trams or light rails on high roads, or on rails carried on posts above the ground.

[*Printed, 2s. 6d. Drawings.*]

A.D. 1847, June 3.—No. 11,727.

HORNE, WILLIAM, BEADON, GEORGE, and SMITH, ANDREW.  
—“Improvements in wheel carriages.”

One part of this invention relates to forming the tire of carriage wheels of galvanized hoop iron, “ of two or more “ parts or thicknesses,” which are first rivetted together and then united into one mass by being “ re-galvanized,” such tires working with less noise than usual.

Axle boxes are also described as being lined or stuffed with fusible metal, hemp, leather, or other suitable material, “ so

“ as to prevent the rubbing contact of iron and iron,” this reducing the noise usually produced by the working of the axle in the box.

Carriage springs are also described as being galvanized in order to prevent oxidation; all the couplings of carriages connected with the axles and springs being also galvanized or lined with some suitable material, “ in order to prevent contact of iron and iron,” and so prevent noise.

Another part of the invention relates to the construction of a timber carriage, “ with framing and roof, and sawing bed “ attached, so that timber may be sawed up where it is felled, “ instead of being taken to a saw pit,” this carriage being furnished with a windlass, and certain slings, blocks, ropes, rollers, and other apparatus by which timber may be raised up to the sawing bed, the first wheels being removed during such operation, and the front part of the carriage being sustained by legs which are then let down to support it.

The invention further embraces the application of mechanism, composed of a winch, or crank, a pinion and a wheel provided with a disc carrying studs, and acting upon internal teeth carried by a pulley, which, through the medium of certain chains and other pulleys, and certain rods or levers, may be made to raise or lower the cover of a carriage at pleasure by turning the winch or crank. Cogged wheels, a screw with a nut and chains, and a screw and lever are all likewise set forth as applicable to this purpose.

Another part of the invention relates to the “universal tractor” described in the specification of the patent of George Beadon of the 29th July 1845, and consists in applying parts of the machinery “differently arranged by an intermediate shaft and bevelled wheels, which can be put in “ or out of gear by the ordinary methods, and cogged wheels, “ band wheels, or universal joint attached by keys and couplings to the end of the intermediate shaft for driving any “ other machinery.”

A “cart or put” is also described, which may be used either for the ordinary purposes of a cart, or to sow seeds, acting as a drill when required. This cart is not boarded at the bottom, but provided with a kind of screw, which may be moved backwards and forwards by means of cams actuated by gearing driven from one of the wheels, thus distributing

soil or manure over the surface of the ground upon which the cart may be moved. Worms upon a shaft driven by the same gearing, may also actuate wheels on the axes of perforated rollers, through which seed may be passed, such seed being directed to the ground by tubes. The body of the cart may be tilted by means of a curved rack and a pinion, and certain flaps may be let down when it is desired to discharge a quantity of earth or dressing from the cart at one spot.

Another part of the invention relates to so hinging the parts of the enclosure of an open carriage together, that "they may pass or slide into the front set or boot of the carriage." And the invention further embraces improvements upon the "lock or wheel plate," described in the Specification No. 8755, A.D. 1840, and consists in "lengthening the fuchelles and fixed sweigh bar to work on a piece called the hooping or perch piece," for the purpose of giving "an increased bearing for the under carriage," as also in the use of square-headed perch bolts to revolve in the top bed or hooping piece, "and front slide, not revolving in the slide or slots, as before done," the wheel plate being, by preference, galvanized.

The invention further includes fixing springs to axletrees by cranking one or more of the plates, attaching a spring to an axle by surrounding the latter with wood or some other non-conductor of sound; a mode of suspending a spring from an axle by means of a belt or cushion of leather or other suitable material; placing the short plates of carriage springs on the interior instead of the exterior of such springs, the upper spring being connected with the axle, and the lower spring with the body of the carriage, the weight of the latter thus expanding instead of closing the springs; attaching the steps of carriages to "detached shafts" instead of to the bodies of such carriages; forming the fronts of carriages, "between the standing or door pillars, of curved or segmental glass," without any side windows; and a mode of hanging the doors of carriages "by hinging the door pillar to the contracted light;" "& attaching the whole or part of the fore pillar to the door."

[*Printed, 2s. 10d. Drawings.*]



A.D. 1847, July 26.—No. 11,815.

DE BERGUE, CHARLES.—Springs. A part of this invention relates to an improvement in springs for common road and other carriages. They consist of rings of india-rubber separated by discs of metal, the whole supported on a central rod. The upper end of this rod is attached to the body of the vehicle, the lower end to an iron stay. It passes through an eye in the axletree, so as to allow the latter to rise and fall and in so doing, to compress the rings between the axletree and the vehicle body.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1847, July 29.—No. 11,821.

MORISON, JAMES.—Propelling carriages. The specification of this patent describes a three-wheeled carriage to be propelled by one or more persons. The propelling is performed through the alternate operation of the carriage seat and a treadle. When the person seats himself his weight causes the seat to descend. This, by means of a flexible band furnished with projections which take into similar projections on a pinion on the driving shaft, causes the shaft to turn. The driver then raises himself by pulling towards him a lever, and throws his weight on the treadle. The treadle continues the rotary motion and compresses a spring which raises the seat for a fresh stroke. The wheels are independent of the driving axle being worked through clutches, so that either may be disconnected if desired. The carriage is steered by the single wheel in front. When going down hill the carriage may be made to store up power by compressing air, which power may be used to assist propulsion.

The invention also relates to an improved wheel having a railway attached to its periphery. A shallow groove is formed round the periphery in which the rails work. They are retained by central projections passing loosely through holes cut in the periphery. Spiral or other springs connect the projections with the nave. The rails are all dovetailed into each other at their ends. Each rail is capable of turning slightly upon its projection to accommodate itself to the varying points of pressure of the wheel.

[*Printed, 11d. Drawings.*]

A.D. 1847, August 19.—No. 11,841.

FARRIES, ARCHIBALD.—“Improvements in propelling carriages on common roads.”

This invention consists in “the construction, arrangement, and adaptation of a certain system of machinery capable of moving and impelling carriages over ordinary travelling roads, the impelling power being obtained from the rotary motion of a sort of tread-wheel to be acted upon by the feet of a person seated in the carriage.”

An arrangement is described in which a vehicle is mounted upon four wheels, the hinder pair being fixed upon the ends of a revolving axle, while the wheels of the front pair are placed loosely upon the ends of an axle which is not capable of revolving, but is connected at its centre with a vertical spindle, mounted in a frame attached to the body of the carriage, this arrangement allowing the wheels to “lock” when the carriage requires to be turned. When this is the case the conductor of the vehicle, by turning a handle fixed upon a short vertical shaft, brings into action certain chain wheels and chains by which the front axle is moved as requisite. On a shaft passing across the framework of the carriage is mounted a “drum wheel,” having upon its circumference radial vanes, and these vanes being acted upon by the feet of the conductor cause the drum to turn, and, by means of a bevel wheel fixed on the same shaft, to give motion through the medium of a short shaft carrying bevel pinions to a second bevel wheel fixed upon the hinder axle of the carriage, the hind wheels being fixed upon this shaft, and their rotation causing the vehicle to move forwards. The bevel wheel on the axis of the tread wheel, as well as that on the axis of the hind wheels of the carriage, are each provided with several concentric rings of teeth, and the pinions on the shaft are capable of being placed in different positions thereon so as to be brought into gear with different rings of such teeth, “according to the rotary power desired to be communicated to the hinder running wheels.”

[*Printed, 6d. Drawing.*]

A.D. 1847, October 14.—No. 11,903.

HORNE, THOMAS. — “Certain improvements applicable to carriage windows.”

This invention relates to certain arrangements of parts in connection with carriage windows, by which they will be less likely to be injuriously affected by variations of temperature, rain, or damp, which usually render such windows difficult to open and close, vibration and the ingress of rain being by the present invention also more satisfactorily hindered.

According to one modification of the invention the sash of the window slides up and down in grooves of metal, which for a portion of their length are partly filled with gutta percha or some other elastic material, or with wood, in order to prevent the sash from rattling, there being space left between the elastic material or wood and one side of the groove for the passage of certain metal plates which are attached to the sides of the sash. In front of the lower part of the sash is affixed a narrow ledge, which when the sash is raised and pushed outwards passes over a corresponding ledge on the lower part of the opening in the carriage door, the sash being thus retained in position. By the use of these ledges the sash need not be pushed outwards when raised as far as is requisite under the ordinary arrangement. The sash may, however, be retained in a partly raised condition by having affixed to it a rack into the teeth of which a spring stop enters. When liberated from the ledge or the stop the sash will in most cases descend by its own weight, but in order to aid the descent, and also in keeping the sash in position when raised, an india-rubber or other spring is connected at one end with the lower side of the sash, and at the other with the lower part of the opening in the door in which the sash works.

The invention also includes certain filling pieces, one on each side the opening for the window, these pieces turning upon axes and being constantly acted upon by springs, these pieces both preventing the sash from shaking, and also the ingress of wind or rain. Arrangements of counterbalance weights for the sash, and of a roller over which the strap passes for raising the sash, are also set forth, as also a mode of employing a certain moveable curved plate to prevent wind and rain from entering through the lower part of the opening for the window.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1847, October 28.—No. 11,927.

EVANS, EDWARD. — “Wheels for railway and other carriages.”

According to this invention the tire or hoop of the wheel is connected with the spokes or with the inner rim or periphery “without the use of bolts or rivets.” When an inner ring is used such ring is formed with a dovetail projection on each of its outer edges, the tire having in its inner surface a dovetailed recess to receive the outer part of the ring, with the projections. When an inner ring is not used, the ends of the spokes carry projections which, with the ends of the spokes, enter a similar groove in the tyre. The projections are in each case made of such size as easily to enter the groove in the tyre when the latter is expanded by heat, and as this still leaves some space between the projections and the sides of the groove, such space is filled after the cooling of the tire by running it into melted metal. When an inner ring is used, it may either be composed of an entire ring previously formed, or of segments.

[*Printed, 6d. Drawing.*]

A.D. 1847, November 9.—No. 11,951.

DYER, REUBEN.—“Improvements applicable to two and four wheel carriages.”

This invention relates to wings or wheel covers for preventing the wheels of carriages from throwing dirt, and the invention consists in the first place in supporting such wings or wheel covers by rods or arms connected to the axletree of the carriage; and in the second place in connecting such rods or arms with the frame or shafts under the body of the carriage; the patentee stating, however, that he prefers the first arrangement, as, according to the second, the wings or covers rise and fall with the springs of the carriage. He states also that he does not claim the use of wings or covers when attached to the body of the carriage.

[*Printed, 5d. Drawing.*]

A.D. 1847, November 25.—No. 11,979.

HUTCHISON, WILLIAM. — (*A communication.*) — “Improvements in treating pasteboard and other substances rendering

“ them compact and impervious to wet frost vermin and destructive agents.”

According to one part of this invention pasteboard is rendered suitable for use in the construction of railway and other carriages, as well as for other purposes, by being first thoroughly dried in a chamber heated to from 60 to 130 degrees Fahrenheit. Such pasteboard may be “ worked or fashioned “ to the shape, form, or device required, before or immediately after submitting it to the drying process,” and after being dried is immersed in a boiling solution or mixture, which is composed of 75 parts of resin or pitch and 25 parts of oil, tallow, or other greasy matter, with the addition, together or separately of pounded stone, chalk, slate, &c. thoroughly dried. The patentee states that glue, gum and other cohesive substances may be used instead of the resin or pitch, but that he prefers to use the resin or pitch, and to mix with the composition some vegetable or mineral colouring matter, which will bring the pasteboard to either a light or dark colour as required, the pasteboard being immersed in the composition until it becomes infiltrated or impregnated therewith, and being thereby rendered able to resist the action of air, water, frost, vermin, and other destructive agents.

In addition to the pasteboard, paper, old rags, hemp, flax, jute, tow, ropes and cordage, hay, straw and other vegetable matter, “ either mixed together or not, and formed into a “ substance” may be similarly treated such materials being “ formed into a substance” by being boiled or mashed together, and then shaped to the desired figure, being then dried, and afterwards submitted to the action of the composition as already mentioned. Plaster of Paris, stone, chalk, and other substances may also be similarly treated.

[*Printed, 4d. No Drawings.*]

A.D. 1848, January 7.—No. 12,017.

BELL, GEORGE.—“ Certain improvements in the arrangement “ of wheels and axles for steam and other carriages, which “ facilitates travelling on railways and common roads; parts “ of which improvements are applicable to other machinery.”

[*No Specification enrolled.*]

A.D. 1848, January 18.—No. 12,029.

LISTER, SAMUEL CUNLIFFE. — “Improvements in railway  
“ trains and other carriages, and generally where a lifting  
“ power or pressure is required.”

One part of this invention consists in a mode of applying brakes to all the wheels of a railway train simultaneously, which is effected by the employment of a tank into which air is compressed by means of a pump worked by one of the axles of the guard's carriages, in which the tank is by preference placed, suitable pipes communicating with this tank and conveying the compressed air (upon the opening of a valve by the guard) to cylinders in which are pistons connected with brakes, the latter being thus pressed upon the carriage wheels. Each carriage is furnished with an air pipe, and the pipes of the various carriages in a train are so jointed together as to admit of the passage of compressed air from one end of the train to the other. Nearly the same effect may be produced by creating a vacuum in the pipes, and causing the atmosphere to press upon the pistons.

By a disclaimer which was enrolled on the 17th July 1848 the patentee removed from the title of this invention the words “and other carriages, and generally where a lifting  
“ power or pressure is required,” on the ground of that part of the invention, which was to have been described in pursuance of those words, being wanting in utility.

[*Printed, 6d. Drawing.*]

A.D. 1848, March 11.—No. 12,094.

ASHBURY, JOHN.—Wheels. The invention consists firstly  
“ in employing certain novel combinations of wood and cast  
“ or wrought iron in the construction of wheels,” by which  
such wheels “are rendered permanently elastic, the various  
“ strains to which they may be subject are more equally distributed, and their dismemberment, should the tyre become  
“ worn or broken, or should it be removed altogether, is  
“ prevented.” Secondly in a novel method of constructing railway wheels. Thirdly, in “certain novel methods of  
“ securing the tyres of wheels.” Fourthly, “in constructing  
“ the tyres of railway wheels with certain novelties of shape  
“ or form, whereby their ‘hold’ upon the wheel is more

“effectually retained.” Fifthly, in “an improved method of ‘preparing’ ‘finishing’ and ‘dressing’ the tyres of railway wheels,” by grinding them with hard stone instead of dressing them in a lathe. And sixthly in causing the wood used in the construction of wheels made according to the present invention “to be saturated with any well known compound by which wood is rendered incombustible or impervious to ignition, or in saturating the wheels previous to putting on the tyres with such materials.”

The details of these arrangements are fully set forth, but will only be understood with the aid of the drawings annexed to the specification. The wheels formed according to the first part of the invention present when completed “the appearance of a complete disc of wood with an iron nave.” Tyres are fixed upon wheels in some cases by being made slightly convex on the inner circumference before being heated and shrunk on, while in other cases the tyres are furnished with internal flanges, bolts, jagged spikes, and other contrivances also aiding to secure them in their places, various modifications of the invention being described.

[*Printed, 3s. 6d. Drawings.*]

A.D. 1848, April 15.—No. 12,127.

DAVIES, DAVID.—“Certain improvements in the construction of the heads of open and close carriages.”

This invention consists in forming the heads of open and close carriages “with framed side windows, which form part of the moveable head on one or both sides of the door, and hinged to the body of the carriage, to which windows the stretchers and flexible covering of the carriage head are attached. These framed windows are hinged to the body of the carriage in such a manner as to cause the roof of the carriage when opened to be thrown back quite out of the way of the heads of the persons sitting in the carriage.”

An arrangement is described in which the body and doors of a carriage are constructed as usual, there being pillars, however, on each side of the doors which rise to a short distance above the body of the carriage, and level, or nearly so with the tops of the doors. Hinged to the upper parts of the pillars are framed panels for the reception of glass, these

forming side windows. In carrying out this part of the arrangement a recess is formed in the top of each pillar within which a segmental piece attached to the under side of the panel works as the carriage head is opened and closed, "forming a kind of rule joint which gives great stability to this part of the head." A metal stop is employed to give steadiness to the head when closed, an iron corner plate strengthening the angle between the pillar and the upper part of the body of the carriage. The recess in the pillar is made good on the outside by a piece of thin plate iron before the flexible covering of the head is put on, and slats or stretchers are hinged to the panels for supporting and keeping extended the flexible covering of the head in the usual manner. The central portion of the roof of the carriage is hinged to the front compartment, and turns back upon it when the head is opened. The joint irons are of the usual construction, but their lower extremities are central on the outside of the carriage body, and their upper ends centred on the framed panels. The leather or other flexible covering is fitted in the ordinary manner, being gusseted, however, at one part, to adapt it to the movement thereof in opening and closing the head.

[*Printed, 6d. Drawing.*]

A.D. 1848, April 20.—No. 12,129.

BRITTEN, JOHN.—Carriage windows. These windows open outwardly from the centre in vertical halves, instead of rising and falling. A portion of the roof projects over the window and is used also as a means of securing the leaves or sashes when open. Bolts attached to them shoot into recesses in the under side of the roof. By the use of this window the carriage is said to be ventilated without draught.

[*Printed, 7d. Drawing.*]

A.D. 1848, April 27.—No. 12,140.

SALTER, ROGER GEORGE.—Carts for distributing liquids. This cart is fitted with a pump worked by a connecting rod and crank from pinions put in motion by the rotation of the wheels. The liquid is pumped from the cart into the delivery pipe, which is fitted with side delivery pipes connected by three way cocks, with the pump and the tank. These cocks



may be worked by hand levers and by their means the distribution from these pipes may be regulated. When a side pipe is shut off, the liquid which would otherwise pass through it is pumped back into the tank. Gear is also provided for throwing the pump in and out of action.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1848, May 11.—No. 12,155.

PRICE, VINCENT.—Propelling carriages. The object of this invention is to dispense with the use of cranks. Accordingly on the driving are keyed two ratchet wheels. Each of these wheels is furnished with a pawl attached to a kind of curved frame. To the latter is attached a chain and rod connected with a treadle. Thus by the movement of the treadle the pawl is caused to engage with and turn the ratchet wheel. To the pawl is also attached an india rubber link. This fulfils two useful purposes. In ordinary work the pressure being removed from the treadle, the latter is drawn back into position for the next stroke, by means of the elasticity of the link. Again if the carriage be backed, the pawl will be pulled back and the flexible link will give to the shock and should the pressure be removed from the treadle the pawl will by it be thrown entirely out of gear. The same explanation applies of course to the other wheel.

The carriage is steered by a pivoting fore carriage controlled by a handle; and there is a hand brake worked by a lever for stopping the vehicle.

The specification relates also to matters not within the present series.

[*Printed, 5s. Drawings.*]

A.D. 1848, June 1.—No. 12,170.

MANSELL, RICHARD CHRISTOPHER.—“Certain improvements in the construction of vehicles used on railways or on common roads.”

This invention consists in the first place in several new and improved modes of applying springs, which the patentee denominates “elongating springs” for the purpose of “supporting vehicles and relieving concussions which occur

“ during travelling,” and also in certain means “ of rendering vehicles supported on bearing or suspension springs more or less susceptible of vertical motion, or in other words easier or more rigid at pleasure.”

Secondly, “ of several improved modes of applying the before named springs to vehicles as buffer and traction springs, for the purpose of imparting elasticity and relieving concussion when such vehicles suffer collision, and further, for relieving the jerks of an unsteady tractive power.”

The essential feature of these parts of the invention consists in so applying curved springs that the action of the weight, force, concussion, or impact to which they may be subjected shall produce a “ tensile strain tending to straighten the springs,” the latter, when used as bearing springs, being adjustable by screws and nuts, and by moving their lower ends in some cases from hole to hole in certain “ suspension irons.” A great number of different modifications of these parts of the invention are described. A method of applying the invention to common road carriages is also described. To the framing of the carriage there is secured a “ curved suspension loop. Within this loop on opposite sides “ safety guide bars” are connected which are attached to the axle tree by flexible joints. Also to the loop, but at lower points are attached the opposite ends of the spring, which at the centre is secured to the axle. Thus the whole is contained within the loop. A modification of this method of attachment is shown.

Thirdly, the invention consists in certain novel combinations in the construction of wheels “ for use on railways or common roads by which such wheels are rendered safer and more economical in wear than those hitherto used.” The spokes are screwed at each end and enter tapped holes in the nave at one end, and in “ shoes” which sustain a wooden rim or felloe at the other. An iron tyre is then placed around the felloe and secured thereon by turning the spokes and expanding such felloe, as well as by the application of certain flanged rings and bolts, or rivets, passing through them and the felloe and shoes, or by bolts or rivets without such rings.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1848, June 13.—No. 12,183.

MILLER, JOHN.—(*A communication.*)—"A new system of " accelerated menatride locomotion, even by animal im- " pulsion, for every species of transport machines, actin by " means of wheels, whether on land or water."

This invention is described at very great length, and under various modifications, and relates not only to locomotives and carriages for railways and common roads, but also to various modes of propelling vessels on water.

One part of the invention consists in a mode of arranging wheels and axles so as to allow the wheels to rotate independently of each other, the axles being each formed in two parts, a wheel being fixed on the outer end of each, and the inner ends being connected by means of a collar, which is screwed upon one of such inner ends while the other rotates freely therein. These are the bearing wheels of the vehicle and the body of the latter rests upon the axles through the medium of other wheels, one of which is in each case directly over the centre of the axle, while two others called " laterals " are placed one on each side of such axle. The two parts of the axle of each pair of bearing wheels are prevented from separating by means of discs, mounted in bearings below the body of the vehicle and working against large collars, one of which is mounted or formed on each part of the axle. The bearing wheels are by preference formed as discs or without spokes.

According to another part of the invention bearing wheels are formed with spokes, the section of which constitutes a triangle having two sides hollowed, and so placed that the vertex of the triangle cuts the air when the wheel is in motion. The spokes are connected with the rim of the wheel by screws formed at their outer ends, the inner ends of each spoke being " like " an arrow or swallow's tail," and being inserted into a mortice in the central part of the nave or hub of the wheel, such nave or hub being composed of three portions, the central part already mentioned and two outer " complemen- " tary " parts, which are connected to the first by screws after the insertion of the inner ends of the spokes into the mortises thereof. The spokes are so arranged as to be nearer together at the outer than at the inner ends, and the patentee states

that wheels thus formed are not only very strong, but also possess "the perfection of elasticity."

Brakes are described as consisting of blocks placed on each side of the wheel and pressed against it by means of levers, furnished with eccentrics or "ears," the levers being connected and worked by suitable mechanism.

An "impulsory" or driving or locomotive apparatus is described as consisting of framework mounted upon one bearing wheel only, such wheel being upon an axle equal in length to the breadth of the machine, the framework of the latter resting upon such axle through the medium of upper central wheels and "laterals" in the manner mentioned above, a lower central wheel, however, being in this case added in order to prevent the body of the machine from rising from the axle. This apparatus sustains an endless moveable floor, supported by polygons, and this moveable floor being put in motion by the feet of an animal or animals, causes rotation of the polygons, which in turn communicate motion to the axle of the bearing wheel through the medium of toothed gearing. This machine is attached to the carriage which is to be drawn by it by means of apparatus so jointed as to allow the machine to assume different angles with relation to the carriage, the machine being provided with brakes similar to those mentioned above. And in front of this machine it is proposed to place a "pilot" machine furnished with a "cutter" for dividing the air, and facilitating the progress of the locomotive and train, such a cutter being also applicable to vessels meant for water conveyance.

The mode of propulsion mentioned above as applicable to carriages may also be applied to vessels on water, and instead of animal power, steam may in both cases be substituted; and such propulsion may also be adapted to machinery in general, the arrangements of lateral and other wheels in combination with axles, mentioned above, being also applicable to shafts in general.

The invention also includes the employment of weighing machines in order to ascertain the weight upon each wheel of a carriage, and likewise the use of an inclined plane down which a train is "to be precipitated when it is to start."

[Printed, 4s. 6d. Drawings.]

A.D. 1848, September 15.—No. 12,269.

SAGER, WILLIAM.—Propelling and steering carriages. Several improved forms of carriage are described. In one the body of the carriage is supported on three wheels, the centre and leading being of great width and having the centre of the periphery or tread flat and the outsides bevilled. This wheel is the driver. The engines, and the axle wheel and other necessary gear are all mounted in a frame capable of side oscillation on trunnions arranged in line with the plane of the wheel. The steam passes to the engines through the trunnion. In order to steer the carriage the frame is oscillated one way or the other; the wheel then runs on one bevilled edge or the other and turns from the straight line accordingly.

In another arrangement the whole machinery is arranged in a frame as above, the wheel not being bevilled, only the frame in this case is turned by toothed gearing in a horizontal plane.

Again, the engines may be stationary and work a single driving wheel, the carriage having five wheels in all, the two leading wheels being used for steering in the ordinary way.

Two other forms of carriage are shown. They are propelled by rods or props. In one case the latter are attached directly to the piston rods; in the other they are worked by means of eccentrics and links. Passenger and other carriages may be coupled with the above propelling carriages.

The invention also relates to boilers for carriages and other purposes and other matters.

[*Printed, 3s. 2d. Drawings.*]

A.D. 1848, September 28.—No. 12,274.

NEWALL, ROBERT STIRLING.—“Improvements in locks, in springs, and in the means of fastening and setting up the rigging of ships.”

That part of this invention which relates to springs applies “to those made partly of vulcanized indiarubber.” Two plates of iron are in the first place so bent that when put together they form a kind of long box, in which are placed square blocks of vulcanized rubber which are separated from each other by thin plates of iron. Projecting pins in the plates of

iron keep the blocks of indiarubber in their places, and space is allowed between the sides of the box and the indiarubber in order to allow for the lateral expansion of the latter when compressed.

Springs thus formed are obviously applicable as bearing springs for carriages, for which reason the invention is noticed here.

[*Printed, 9d. Drawing.*]

A.D. 1848, November 23.—No. 12,338.

SCHIELE, CHRISTIAN.—Reducing friction of axles, &c. For the purpose of reducing the friction resulting from pressure acting in the direction of the axis, the shoulder of the axle is made of a curved form.

“The nature of the curve” which the patentee prefers “as generally the most suitable . . . consists in having every tangent of the same length from the touching point to the point of intersection with the axis of the curve.”

[*Printed, 8d. Drawing.*]

A.D. 1848, December 16.—No. 12,369.

WHARTON, WILLIAM.—Wheels. This invention relates to the construction of wheels suitable either for railway or other carriages.

The first part of the invention consists more particularly in the employment of wedges or wedge-shaped pieces of metal in combination with and adapted to curved or bent spokes of metal, the arrangement being such that by a suitable adaptation of screws to the wedges they are made to compress the curved sides of the spokes and so cause the outer portions thereof to be pressed forcibly against a wooden felloe and fix it firmly inside a tyre of metal. Another arrangement is also described in which wedge-shaped pieces of metal are forced by means of screws between and against blocks of wood forming substitutes for the spokes of a wheel thus solidifying such wheel.

A modification of the first part of the invention is described in which the wooden felloe is dispensed with and “taper blocks” introduced between the inner ends of the curved spokes, and the outer tyres of all these wheels may either be

flanged so as to adapt them for railway purposes or plain so as to be suitable for common roads.

[*Printed, 9d. Drawing.*]

A.D. 1849, March 14.—No. 12,514.

CLARKE, THOMAS, and MOTLEY, THOMAS.—Steam carriage. For the purpose of steering such vehicles each wheel of a pair runs upon a sleeve or socket through which the axletree is passed and to which it is fixed. This sleeve or socket is so shaped externally that the wheel is capable of being moved at an angle to the axletree by means of a lever. The pair of levers are so arranged as to be worked together and the result is that by turning each pair of wheels individually at an angle the carriage may be steered without the necessity for removing the axletree.

Various forms of steam carriage are shown and described. The propulsion is effected through the assistance of intermediate shafts, radius rods, and like contrivances, together with bands or pinions, so that the carriage may be supported on elastic springs. A similar mode of applying power to the above-mentioned moveable steering wheels is also described.

There is also described a carriage made up of two bodies or compartments, each carried by two wheels, linked together by rods at top and bottom and by crossed corner chains in such a way that the motion in steering of one part is communicated to the other. A somewhat similar carriage is described in which the hind part is steered from the front by means of a toothed segment and worm wheel.

[*Printed, 4s. Drawings.*]

A.D. 1849, April 2.—No. 12,555.

GEACH, CHARLES, and WALKER, THOMAS.—This is an extension for the term of four years from the fourth day of April 1849, to the above named assignees of James Hardy, the original patentee, of an invention (No. 6807, A.D. 1835) for "A certain improvement or certain improvements in the making and manufacturing of axletrees for carriages and other cylindrical and conical shafts."

A.D. 1849, April 13.—No. 12,563.

BRANDT, WILLIAM GASPARD.—Axles. This invention consists in making the nave of the wheel larger than usual, boring it out, and inserting friction rollers in such a way that they surround the axle which revolves between them.

[*Printed, 6d. Drawing.*]

A.D. 1849, June 20.—No. 12,663.

CAMPBELL, ALEXANDER FRANCIS.—Wheels. According to the first part of this invention a wheel is formed which may be used either on a common road or upon a railway. The wheel has "compound spokes," each of which is formed by bending a flat bar of iron in such a manner that the two ends which are turned outwards may be united to the nave by means of hoops and bolts, the rest by the bar extending towards the ring or tire of the wheel in two lines which gradually approach each other, the central part of the bar forming a short cross bar for supporting such ring or tire. Between the spokes and the ring, however, the ends of tie bars or rods are inserted, these bars passing in straight lines from the top of one spoke to the top of another, the whole being secured by rivets passing through the spokes, the tie bars, and the ring or tire. When the wheel is intended for railway purposes a suitable flange is bolted to the upper parts of the spokes on one side of the wheel, such flange being sufficiently wide to extend beyond the ring or tire.

Another part of the invention relates to placing a flexible ring or tube containing water around the circumference of a carriage wheel. This tube rests on a grooved ring of india-rubber, wood, or gutta percha fixed around the rim or tire of the wheel, being retained therein by straps of vulcanised india-rubber, secured to the rim of the wheel by circular plates and screws. The tube itself is composed by preference of gutta percha. Wheels thus formed appear to be meant for use on common roads only. The other parts of the invention do not require notice here.

[*Printed, 3s. 5d. Drawings.*]

A.D. 1849, July 7.—No. 12,699.

FULLER, EDWARD IVES, and TABERNACLE, GEORGE.—Springs for carriages. The object of this invention is to



obviate as far as possible the unpleasant effects of the recoil of carriage springs when in action, "as the recoil of springs " as at present constructed and adapted to carriages produces " much uneasiness of motion, and frequently occasions the " springs to break or become strained or injured," and the invention consists in "connecting the springs at one or both " ends to each other when two springs are employed, or to a " rigid bar when only one spring is used, in such a manner " that the ends of the springs may have sufficient play horizontally when they elongate or flatten by being loaded, so " that their free action may not be checked suddenly, as " sometimes happens when the ends of the springs are connected together by slings as is now generally the case."

The patentees state that various modes of carrying out the invention may be devised, and describe several modifications of the invention, in one case a slotted box or bearing being secured to the end of the under spring, a sliding stud or bolt on the upper spring working in the slot. This system is described as applied both to a double elliptic spring and a demi-elliptic spring, the latter consisting of a single spring, one end of which is jointed to one end of a curved rigid bar, the other end of the spring being furnished with a pin which slides in a slot in the bar.

The patentees mention that for common carriage springs for ordinary purposes it will generally be found advisable to connect the two springs together at one end by a common joint, so as to leave all the horizontal play for the other end of the springs, but in some cases when the springs are secured to the axletrees or boxes at or near their middle, "such as for " railway purposes," it will be found desirable to allow play at each end of the spring.

An adaptation of the invention to a railway carriage is described, in which the springs are secured in the middle between the horns or axle guards in such manner as to leave vertical play in the slot or space between the horns, each end of the springs being provided with a stud or bolt, which works in a slotted bearing fixed to the under side of the carriage framing. This part of the invention may also be modified so as to be suitable for heavy carriages for ordinary roads. And an arrangement is described in which the ends of carriage springs are secured "to the fulcrum and one end of a bell

“ crank lever in such a manner that the lever may work “ freely on these points,” this arrangement being meant as a substitute for either the shackles or slings usually employed, or the slotted bearing and sliding stud or bolt mentioned above. The right hand end of the lever spring carries the fulcrum pin of the bell-crank lever, and the corresponding end of the upper spring is connected to the outer corner of the lever.

[*Printed, 9d. Drawing.*]

A.D. 1849, July 18.—No. 12,713.

BROTHERHOOD, ROWLAND.—Covering for waggons, &c. This covering consists of a canvas or other flexible tilt supported upon longitudinal bars or bearers carried by “ radius “ rods.” The rods work on pins or joints at the ends of the vehicle in the manner of a fan. When the vehicle is to be closed by the covering, the frame with the tilt is drawn over from one side to the other by means of ropes. The lower edge of the tilt is fastened to a bar or strip of elastic wood or whalebone, which is secured to the waggon by locks or otherwise so as to prevent improper access to the waggon. The tilt overlaps the radius bars and is fastened down by straps. The tilt may also be secured in position when partly, so as to protect sheep or other animals requiring both air and shelter.

[*Printed, 10d. Drawing.*]

A.D. 1849, August 30.—No. 12,754.

BERTRAND, ISIDORE.—“ An improvement in protecting “ persons and property from accident in carriages.”

This invention consists “ in certain mechanical arrange- “ ments adapted to the axletrees of wheels for vehicles, by “ which the wheels and horse or horses can be stopped at “ will,” accidents from horses running away being thereby prevented.

A mode of carrying out the invention is set forth in which the naves of the wheels work upon cylindrical arms at the ends of the body of the axletree, there being shoulders at the inner ends of the arms, over which pulleys are made to slide, being thrust forward towards the wheels when requisite by

means of certain racks which are acted upon by "catchings" or teeth which act in the manner of those of a pinion, the apparatus being applied to each wheel of the vehicle alike, and each apparatus being brought into action by means of crank arms, and certain details connected therewith. On the pulley belonging to either wheel being pushed towards that wheel certain cogs or projections on the pulley enter the nave of the wheel, this causing the pulley to rotate, and tighten a strap connected thereto which is connected with the musrol of the horse's bridle, the horse being thus compelled to stop, a catch at the same time acting against one or other of certain cogs and serving "to prevent the wheel from turning backwards if the horse were endeavouring to draw back."

The invention may be applied to either straight or cranked axles, and the details of the invention may be varied, elbow levers being in some cases substituted for the "catchings" mentioned above.

[*Printed, 9d. Drawing.*]

A.D. 1849, November 10.—No. 12,839.

CHAMBERS, ENOCH.—Wheels. This invention consists in making the nave of wrought iron in two parts, divided vertically, each part having half the number of spokes, with a portion of the felloe attached to each spoke. These two half naves and parts of felloes are then welded together, after which the tire is shrunk on as usual. The spokes are attached to the half naves by welding them to portions of a projecting flange thereon.

Instead of welding the spokes and parts of the felloe to the half naves before welding the latter together, the spokes and parts of the felloe may be welded on afterwards, but the former method is preferred by the patentee.

[*Printed, 9d. Drawing.*]

A.D. 1849, November 17.—No. 12,848.

POWNALL, CHARLES JAMES.—Passenger counter. This invention consists in arranging the step of a public carriage in such a way that the weight of a person standing on it completes an electric circuit which works an indicating apparatus. The step is protected against fraudulent attempts to prevent

its action, and it is also provided with a guard to prevent its use when the door of the vehicle is closed.

[*Printed, 10d. Drawing.*]

A.D. 1849, November 24.—No. 12,861.

COWPER, CHARLES. — (*A communication.*) — “Certain improvements in piling, fagotting, and forging iron for plates, bars, shafts, axles, tyres, cannons, anchors, and other similar purposes.”

This invention relates, firstly, to “certain new forms and arrangements of bars for the construction of piles and fagots for the manufacture of iron generally.” In place of employing “flat bars, of a square or rectangular section or of the form of a sector of a circle as has hitherto been customary,” the patentee employs “bars whose section is a trapesium, arranged in a great variety of ways,” as requisite for the production of the intended article, whether an axle, a plate, or other object. The bars are formed by rolling, the rolls being provided with grooves of the proper shape. Various modes of applying this part of the invention are described, but the arrangements relate for the most part to matters which have no connection with the subject of the present series of abridgments.

Another part of the invention relates to the formation of wheel tyres by coiling and rolling.

Another part of the invention relates to the manufacture of wrought-iron wheels. A ring of iron is first formed by winding up a bar upon a mandril and hammering it so as to weld the coils firmly together. A second ring of smaller diameter but much thicker than the first is now prepared in a similar manner and is placed within the first and hammered so as to cause it to spread and become united with the outer ring, the compound ring thus obtained being now submitted to a succession of swaging operations by which it is gradually converted into a complete wheel, having a nave in the centre and a disc uniting such nave with the outer portion. A wheel, however, may be produced by a single ring only such ring being formed in the first place by winding round a mandril a bar much wider than those employed when two rings are used and the mandril being of small size. Wheels thus produced may be either plain on the outside and have flanged

tyres shrunk upon them or the flange may be formed during the swaging process. And the disc which unites the nave and the outer part of the wheel may be either in the centre or on one side of such wheel and may be ribbed so as to give strength thereto.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1849, December 3.—No. 12,874.

PARADIS, JOSEPH.—(*A communication.*)—Springs. The patentee describes a new form of spring which he uses for stuffing cushions, &c. and also for carriage purposes.

The spring “consists of a single piece of iron wire, the ends of which are inserted into holes made in the ends of a cylindrical wooden or metal roller, round which the central part of the wire is coiled or wound to form a helical or coiled spring. The ends of the wire, although inserted into holes at each end of the roller, are not fixed therein, but are allowed a proper amount of play. When pressure is applied to either or both ends of the spring, the ends will be found to approach each other, and the coiled part of the spring will be forced outwards, and will thereby be caused to unwind in both directions, during which operation a great amount of resistance will be offered by the elasticity of the spring.”

The patentee shows the application of this spring to a two-wheeled carriage. He prefers to use one pair on each side of the carriage, but if thought advisable a row of springs may be arranged along the back.

[*Printed, 10d. Drawing.*]

A.D. 1849, December 3.—No. 12,876.

DE STRUBING, Baron JAMES ULRIC VAUCHER.—Axle boxes. The invention consists in lining the axle box with a soft metal consisting of 75 parts of zinc, eighteen of tin, four and a half of lead, and two and a half of antimony. The axle is placed in the box, the end of which is closed by a metal plate, and the metal run into the intervening space through holes in the box. In order to leave a channel for the oil or other lubricant a band is wound tightly round the axle at the required place before it is inserted. This forms a rib on the axle, and when removed leaves a groove in the cast lining.

[*Printed, 1s. Drawings.*]

A.D. 1849, December 10.—No. 12,883.

CHRISTIE, JOHN STOUGHTON.—(*A communication.*)—Wheels. The object of this invention is to form wrought-iron wheels which may be suitable not only for railway purposes, but for use on common roads, and it consists, firstly, in fastening the various parts necessary to form the wheel temporarily together, and then raising the whole to a welding heat, and welding them together in a mould; and, secondly, in certain machinery and apparatus suitable for the purpose of the invention.

To form the nave or hub of the wheel certain pieces are employed which have been cut from bars, the section of which is an isosceles triangle, these pieces forming, in fact, wedges which are, in the first place, arranged with the points inwards around a temporary axle. A tire of proper size is then formed by bending a flat bar of iron into the form of a circle, and welding the ends together, and this tire is then placed concentric with the hub or nave and spokes, also cut from flat bars, are then inserted so as to extend from the inside of the tire to the temporary hub, the inner ends of these spokes being introduced between the wedge-shaped pieces already mentioned, and the other ends of the spokes being so bent as to lie for some distance parallel and in contact with the tire with which they are united by small rivets, or by any other convenient means, the parts forming the hub or nave being also temporarily secured by hoops or rings placed upon their ends. These parts are now ready for welding together, and this is effected by placing the whole in a cylindrical box of metal, the bottom of which forms a die corresponding with the intended shape of one side of the finished wheel, there being placed between the spokes certain blocks arranged in pairs, and these blocks being acted upon by wedges connected with the lower face of a heavy ram or hammer, which on being let fall drives the wedges between the blocks, and by forcing them "outward from each other by a steady horizontal movement," effects the welding of the different parts of the wheel together, the lower face of this ram also forming a die by which the upper side of the wheel is shaped. The blocks have fins projecting from their lower sides, which pass down through slots in the bottom of the mould, and serve not only to guide the blocks, but to furnish means of moving when necessary,

and through the centre of the 'mould is a circular hole for the passage of a mandril suitable for finishing the eye or bore of the hub or nave of the wheel. This mandril may be attached to the ram, "yet loosely so as to detach itself after the first " blow." These arrangements are suitable for producing a wheel without a flanged tire, and in order to produce such a tire (which is to be afterwards placed on the wheel) a mould is used of suitable form in which the pieces of metal which are to compose the tire are placed in a heated state, and then operated upon by blocks around the inner circumference of such metal, and driven outwards by wedges carried by a hammer or ram, and which on falling are driven down between the back portions of the blocks and a certain projection arising in the middle of the mould and furnished with " facets " opposite the blocks. The ram may be formed in one piece or block, or it may consist of two parts one being placed above the other, the lower part carrying the wedges, this allowing the upper portion to strike upon the lower without the wedges being withdrawn from the blocks. Each pair of blocks is kept together by springs when not acted upon by the wedges, and in forming a tire the tread and flange may be faced with steel if desirable by placing a layer of steel outside a layer or layers of iron, and welding the whole together.

[*Printed, 10d. Drawing.*]

A.D. 1850, January 11.—No. 12,924.

COOPER, ALFRED.—Propelling carriages. This invention relates to various improvements, among which is described a method of communicating the propelling power to the wheels. Instead of driving them from the axis in the usual way, the machinery is caused to put in motion a train of toothed gearing, which ultimately engages with teeth placed round the wheel face as near the periphery as may be. The application of the motive force is thus tangential to the circle.

[*Printed, 1s. Drawings.*]

A.D. 1850, January 17.—No. 12,930.

COWING, HENRY. — "Improvements in obtaining motive " power, and in steam and other ploughs, in land carriages, " in fire engines, in raising water for draining and other

“ agricultural purposes; and in apparatus for evaporating  
“ saccharine and other liquors.”

[*No Specification enrolled.*]

A.D. 1850, April 18.—No. 13,045.

BUCKWELL, WILLIAM, and FISHER, GEORGE.—Springs. The first part of this invention consists in so constructing springs that “ the tensile strength or application of metal is “ brought into action in giving elasticity or pliability ” and in the application of such springs “ to act against the “ force or load in the direction of their tensile strength.” This part of the invention is described at some length but consists in reality in constructing a spring in the form of an “ oval or ellipsis ” composed of steel, and thickening gradually from the sides to the ends either by the metal itself being thicker in proportion, or by the introduction of suitably formed plates. Such a spring may be used as the bearing spring for a carriage or truck, being placed with the longer axis of the oval or ellipsis in a vertical line, and the spring when acted upon, having the sides bent outwards, the main feature of this part of the invention apparently consisting in causing the spring to assume a greater curvature of form when loaded than when unloaded, whereas in springs generally used for bearing springs the reverse is the case.

The second part of the invention relates to railway buffer and traction springs.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1850, May 22.—No. 13,077.

HURRY, HENRY COLUMBUS.—“ Certain improvements in the “ method of lubricating machinery.”

Part of the invention relates to the lubrication of the axles of railway and other carriage wheels, and other moving parts of machinery, “ and consists in forming a chamber “ within the revolving part suitable for the reception of the “ lubricating material.” Two modifications of this arrangement are described, in one of which a railway wheel is fixed upon a hollow axle, this rotating upon bushes or steps placed upon a fixed axle supported in plummer blocks, and a passage leading through the fixed axle from the grease box



through which the lubricating material flows to openings formed through the bushes or steps to the inside of the hollow axle. In the other modification the fixed axle is not perforated, the oil passing from the grease box into a chamber formed by a ring placed in a groove in the plummer block, and pressed against the wheel by springs, such oil passing from the chamber to the hollow axle.

[*Printed, 6d. Drawing.*]

A.D. 1850, May 28.—No. 13,084.

NEWTON, ALFRED VINCENT.—(*A communication.*)—"Improve-  
ments in couplings for carriages and in the attachment of  
wheels to axles."

The first part of this invention consists of a "fifth wheel  
for coupling the fore axle and the perch of a carriage."  
This "fifth wheel" consists really of two circular plates so  
formed that by one movement they can be interlocked or  
combined, and so form a union which enables the "king  
bolt" to be dispensed with.

The second part relates to a method of attaching whiffle  
trees by means of interlocking discs, so that if necessary it  
can be used with only one trace thus guarding against the  
danger of a broken trace.

Another part consists in connecting the hood bows by a  
shaft at the back of the seat fitted with a hand lever so that  
the hood may be raised and lowered from the carriage.

It further relates to a method of attaching the wheel to the  
axle. Instead of using a linch pin, spring hooks fitted in the  
axle take into a groove in the box and cannot be removed  
until the pressure of the springs is relieved. The positions  
of the hooks and springs may be reversed if preferred.

Finally the invention relates to "a mode of connecting  
those parts of the wheels of all vehicles used for locomotion  
which encounter or receive the shocks in moving onward  
with those parts which play upon the axle. These con-  
nections are so made as materially to arrest all shocks  
received by the wheel at the circumference before they  
reach the axle" such effect being obtained "by interposing  
between the nave and rim some permanently elastic sub-  
stance, as india-rubber or compounds of like character, or

“ elliptical, spiral, or corrugated springs of steel,” these being placed within the hub of the wheel.

[*Printed, 7d. Drawing.*]

A.D. 1850, June 1.—No. 13,090.

POOLE, MOSES. — (*A communication.*)—“ Improvements in  
“ machinery for punching metals, and in the construction of  
“ springs for carriages and other uses.”

The second part of this invention only requires notice here, this consisting “ in forming an endless metallic spring for  
“ carriages, and all purposes for which such springs are  
“ applicable. The peculiarities are to be found in the method  
“ of treating the spring metal in making the spring, so that  
“ after producing a variety of curves from a narrow slip of  
“ the metal the ends should terminate and be firmly attached  
“ by brazing, welding, or other suitable device upon some  
“ part of the main body of the piece itself, the effect pro-  
“ duced being such that vibration of the spring, instead of  
“ running out at the ends as in common springs, will pass  
“ to the points where they are joined to the main body, and  
“ react upon it with a certain intensity, tending to maintain  
“ the vibration. By compounding the curves, which can be  
“ done in numerous ways, very great leverage is produced in  
“ the spring itself, so that much greater pressure can be  
“ sustained by it safely, compared with the weight of metal  
“ used, than in the old way.”

Different modifications of the invention are described, in some cases a strip of spring steel being curved so as to form two circles, “ held together by a semi-elliptical band;” while in other cases the form is varied “ so as to increase the  
“ leverage.”

[*Printed, 1s. Drawings.*]

A.D. 1850, July 23.—No. 13,189.

HAZELDINE, GEORGE.—“ Improvements in the construction  
“ of waggons, carts, and vans.”

Before describing this invention the patentee mentions that in constructing waggons, carts, and vans, it has been usual to employ cylindrical “ staffs,” driven through the “ raves,” or side framings, and into the framing of the bed or bottom of

the vehicle, the "raves" being moreover supported by "stud staffs," and having screw nuts on their upper surfaces which prevented goods from being slid from one end of the vehicle to the other without injury to the packages. He then states that the object of his improvements is to dispense with the use of "staffs" so driven through the raves, and to employ raves of angle iron for supporting and strengthening the sides of the waggon, cart, or van; an iron bar furnished with projections or belaying pins being used to "fasten the ropes to." Diagonal stays are applied to the pillars, "to suspend the tail board from," and such stays are also applied to the front corner posts, and binding plates with rings. The driving seat has a box underneath it for the reception of sheets or wrappers, horse cloths or nose bags; the seat moving on hinges to admit of the introduction of such articles.

The invention includes the application of a hinged catch or stop, which "being hinged to the pole socket drops into a recess formed in the pole," the particular object of this catch or stop not, however, being mentioned.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1850, July 23.—No. 13,191.

DUNBAR, GEORGE. — "Improvements in suspending carriages."

This invention "has for its object the suspending carriages from the axle by flexible bands, braces, chains, straps, or cords."

Two modifications of the invention are described, but although these differ somewhat in detail "they are alike in principle." In each case a strap, brace, band, chain, or cord is attached to the axle on each side of the carriage, such straps, &c., extending both forward and backwards from the axle, and sustaining the weight of the carriage. In one case, however, a double strap, band or cord is used, a lever, the position of which is adjustable by means of a screw and nut, being used to regulate the tension of the strap, band, or cord. In the other case the flexible suspending bands or cords are adjusted by means of barrels having connected with them ratchet wheels and catches. Both arrangements are shown as being applied to a vehicle with two wheels only.

[*Printed, 5d. Drawing.*]

A.D. 1850, November 2.—No. 13,314.

CLYBURN, RICHARD.—(*Partly a communication.*)—"Improvements in wheel carriages."

[*No Specification enrolled.*]

A.D. 1850, November 9.—No. 13,328.

ROCK, JAMES, junior.—"Certain improvements in carriages, which are also applicable in whole or in part to other machines."

This invention relates in the first place to carriages with moveable heads, and the patentee states that a "principal object" of this part of the invention has been "to form the moveable or shifting parts above or on the elbow line of such shapes that, by the leaving out of some or substitution of others, the general form or appearance of the carriage may be varied to a much larger extent than has hitherto been practicable. Various modifications of this part of the invention are described." One arrangement is set forth as being applicable to that description of carriage called a "dioropha," which is fitted with a moveable canopy, the hinder part of which may be closed when required. The panels, which may either be separate or be united by hinges or otherwise, are made to fit into grooves formed in the lower part of the canopy roof, and rebated at their lower edges to shut down over the upper edge of the body so as to exclude wet. Such canopies may also be applied to bodies constructed with moveable elbow pieces, or with one or more moveable heads, such canopies being supported by pillars or rods, and the roof or covering made capable of winding upon a roller passing over the centre of the body from back to front. In carriages such as the "dioropha" the under lines of each head and its appendages are different from those of the others, a separate set of elbow and door pieces being provided to put on when the carriage is to be used without either head. One carriage is thus made to serve the purpose of three; "that is, first, a "close carriage; second, a half-headed or barouche carriage; and, third, an entirely open carriage." Moveable elbow and door pieces are also provided which complete the elbow line of an open carriage, when such carriage is furnished with a moveable head or heads, irrespective of any change of curve in the said elbow line.

Other arrangements are described, in some of which the roof is formed with hinges or joints, so as to fold backwards upon the hind part of the head. When convenience for stowage is required in the parts removed the upper quarter and the back panels are furnished with hinges, joints, &c., so as to permit of their being folded up compactly. In other cases the whole of the roof is removed by itself, and the hind quarters and back panels by themselves, the parts occupied by these panels being sometimes formed of leather, capable of folding in the same manner as the corresponding parts of a landaulette, a mode of disposing of the glasses and pillars (when necessary) being also set forth.

The second part of the invention relates to turning or locking carriages, "and consists in using a spring or springs, "instead of or in combination with the centre pin or perch "bolt generally used to enable a carriage to turn round a "corner or change its course." Different modifications of this part of the invention are described.

Another part of the invention relates to the steps of carriages. According to one arrangement a connecting rod is placed between the two heads of a double step, so that when either of the treads is moved by hand or otherwise the other is moved simultaneously therewith. Various arrangements for causing the steps to be opened and closed by the opening and closing of the carriage door are set forth, levers, weights, toothed segments and pinions, and other mechanism being used in carrying out these arrangements. A mode of enabling a person on the driving seat of a carriage to open the door or doors and put down the step or steps without alighting from his seat is also described, the whole of these arrangements being set forth in detail, and at considerable length.

Another part of the invention relates to springs for carriages. A blade of spring steel is heated and then beaten in a mould so contrived as to produce upon it a longitudinal hollow rib, tapering at each end to a point, this completing the spring, with the exception of the ends, "which may be "formed according to any of the usual methods." Instead of a mould, rollers may be used to produce the rib. These blades may be used singly, or where great strength is required two or more blades may be combined together, in some cases two blades being placed together with their concave sides

inwards, and the space between them being filled up with gutta percha or other substances adapted "to prevent vibration and exclude wet." In these cases it is necessary to draw or thin down the ends of one of the plates, which the patentee calls the "auxiliary plate" in order that it may keep close to the other which is called the "main" plate, and not "gape" when under pressure. When very great strength is required two auxiliary and two main plates may be combined together, while for a "very easy" spring a plate may be used a large portion of which, extending from each end, is left flat, or "without any rib."

[*Printed, 1s. 5d. Drawings.*]

A.D. 1850, December 5.—No. 13,384.

FRANKLINSKY, JOSEPH ALEXANDER. — "Improvements in public carriages for the conveyance of passengers."

The first part of this invention relates to omnibuses, and consists in dividing an omnibus into numerous compartments, "each compartment having its own door or entrance, with ready means of approach thereto;" this being accomplished "by having several doors on either side" along with a suitable platform and guard rail. By this arrangement "each passenger will have all the comfort and privacy of a private single carriage." The partitions dividing the omnibus into compartments may be entirely closed, or they may for the convenience of friends in neighbouring compartments communicating with each other be furnished with sliding panels, with or without glass, the parties on either side of such panels, however, having the means of fastening them when they desire to be private. A bell or speaking tubes may be arranged as a means of communication between the passengers and the conductor. "Omnibuses of a similar character may be constructed for railways."

The second part of the invention relates to the construction of cabs so as "to render them suitable for running continually between places, and taking separate passengers who may happen to be going in the same direction between such places." For this purpose the body of the cab is constructed in such manner that the passengers may enter on either side and take a seat in a separate compartment. And in order to separate the passengers from each other the body

is divided into three compartments, each suitable for one passenger, there being a door for each compartment. The driver sits in front and his seat is sufficiently wide to accommodate two passengers along with him, the vehicle thus being adapted to carry five passengers, along with the driver. The exterior form of the body of the vehicle may be varied.

[*Printed, 7d. Drawings.*]

A.D. 1851, January 18.—No. 13,459.

BYCROFT, RICHARD.—“Improvements in apparatus to be “used by persons to secure warmth and dryness when travelling.”

This apparatus consists in the first place of a light metal frame, which is capable of being folded up, either wholly or partially, an air or otherwise formed elastic cushion being connected with this frame, and a covering material of waterproof fabric being attached thereto when it is intended to secure dryness. In order to secure warmth the covering material should be lined with piled or other warm fabrics, or in place of these sheep or other skins or fur. Various modes of arranging these parts are set forth, in some cases the apparatus assuming the form of a folding hood, and a wrapper to proceed down over the shoulders and back and fold in front, the patentee stating that apparatus thus combined will be found very serviceable for persons riding in open carriages, whether by railway or otherwise, especially “owing to its “folding into a small compass.”

[*Printed, 1s. 9d. Drawings.*]

A.D. 1851, January 23.—No. 13,473.

BUNNETT, JOSEPH.—Omnibuses and axleboxes. The first part of this invention relates to a method of constructing omnibuses for the purpose of improving the accommodation. The outside seats are arranged in various ways, but, with the exception of the places on the box seat, the seats are curved and slightly recessed into the roof of the vehicle by which means accommodation for a larger number of passengers is provided. Access to the seats is obtained by steps arranged according to the position of the seats. The roof of the omnibus is raised to afford head room inside and is fitted

with ventilating louvres and hand rails. The inside seats are separated by guards and arm rests, by which immunity from robbery is said to be secured.

The improvements in axle boxes consist in the use of compressed leather bearings or brushes. A series of annular discs of this material is placed between the inside shoulder on the axle and a recess in the box ; and a leather bearing is also compressed into a cavity formed near the outer end of the box. Between these two bearings is a cavity for the lubricant. Applications of the invention to railway purposes are also described.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1851, January 31.—No. 13,485.

DAVIES, DAVID.—“ Certain improvements in the construction of wheel carriages.”

This invention relates in the first place to “ an improved wheel plate, or wheel locking plate,” and consists in “ a peculiar mode of constructing wheel plates with two axes or centres, so as to enable the front wheels of a four wheel carriage to lock or turn round in a shorter space than they can do if one central pin or bolt only is employed.” An arrangement is set forth in which an under plate of iron is affixed to the fore carriage, and turns with the front wheels, an upper plate being attached to the under side of the driver’s seat, two studs or horns projecting upwards from the lower plate, and working round or traversing within the curved sides thereof.”

Secondly, the invention relates to “ an improved square or quadrangular umbrella, applicable as a covering to open carriages,” the opening and closing of this umbrella being effected by means of a certain socket, and certain stretchers, springs, and other details.

Thirdly, the invention relates to a “ single wheel pedomotive or exercising carriage.” This consists in the first place of an outer rim or wheel within which is another concentric wheel, turning freely, and kept in its place by a flange or by antifricition guide wheels. A seat or saddle is connected with the apparatus, upon which the user of the apparatus sits astride, propelling himself by applying his feet to the ground and guiding himself by means of handles attached to the inner wheel. A modification of this part of the invention is



described by which the machine is made capable of accommodating two persons.

Another part of the invention relates to a "retiring carriage or urinal," which may be placed temporarily in public thoroughfares. The entrance door is furnished with apparatus by which the number of persons entering the machine may be ascertained, and certain arrangements are made for ensuring the ventilation as well as privacy of the apparatus.

Another part of the invention relates to a brake applicable to railway carriages, but this is noticed in the series of abridgments relating to those vehicles.

[*Printed, 10d. Drawing.*]

A.D. 1851, February 11.—No. 13,506.

HEYWOOD, BENJAMIN. — "Improvements in railway and other carriages."

This invention consists firstly, "in so constructing the sliding windows of railway and other carriages that the wooden framing which usually surrounds the glass is entirely dispensed with, and the window is formed of a plate of glass, the edges of which are suitably rounded," so as not to cut the lining in which it moves.

Secondly, "in lining the grooves of carriage windows with vulcanized india-rubber, leather, velvet, or other suitable material, instead of covering the edges of the window frame with the same;" and,

Thirdly, "in securing the glass string or strap by which the sliding window is raised or lowered to carriage windows made entirely of glass," either by means of clips having screws which pass through holes in the glass and furnished with tubes around which the string is sewn, or by means of plates between which and the glass the string is pressed by screws which also pass through the glass, a lining of some soft substance being interposed between the plates and the glass in order to prevent the latter from being fractured in tightening the screws.

[*Printed, 6d. Drawing.*]

A.D. 1851, February 11.—No. 13,510.

WEBSTER, JAMES.—"Improvements in the construction and means of applying carriage and certain other springs."

This invention is described at some length and under various modifications, but consists essentially in so constructing carriage and other springs that each point or arm of each spring shall act against an inclined plane when in operation. When such a spring is used as a bearing spring the spring may be attached to the sustaining body and the inclines to the body to be sustained ; or the spring may be connected with the latter and the inclines with the sustaining body.

A spring is described, in the first place, as being composed of a straight horizontal part which forms the base and two curved arms, one of which rises from each end of the base, the upper end of the arms being slightly bent towards each other, and entering between two inclined planes placed above the spring, the arrangement being such that the depression of the inclined planes will force the arms of the springs towards each other, the latter thus forming in fact an elastic support to the inclined planes. Thus a spring so formed may be fixed upon the axle box of a railway carriage and the inclines project downwards from the framing of such carriage. Such a spring may also be applied as a draw spring, the spring itself being connected with the framing of the carriage and the inclines to the draw bar ; and similar springs may also be attached to the buffer rods of railway carriages and act when the rods are thrust inwards against inclines bolted to the framework. All these arrangements may be varied according to circumstances the springs being each in some cases composed of one plate only and in other cases of several plates and in some cases the ends of the spring instead of entering between two inclines, embracing a piece of metal of which the two sides are inclined the ends of the spring being thus forced asunder by the inclines instead of being pressed towards each other. In order to avoid the injurious effects of friction upon the ends of the springs they may be furnished with small rollers and if desirable the inclines may be made double or so as to act upon the spring whether depressed or raised, this tending to prevent any jerking action upon the rising of the inclines after sudden depression. Instead of the sides of the inclines being straight lines they may be slightly curved in which case the action of the inclines upon the springs will increase as they descend.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1851, March 4.—No. 13,542.

NEWTON, ALFRED VINCENT.—(*A communication from C. Good-year.*)—Composition for various purposes. The composition which the patentee describes consists of a mixture of india-rubber or gutta-percha with the carbonates or sulphates of lime and magnesia and other gums, incorporated by a masticating machine. It is moulded as required and then subjected to a high temperature. The mixture may also be applied to iron sheets and in this form is useful for various purposes such as carriage dashers and furniture.

[*Printed, 4d. No Drawings.*]

A.D. 1851, April 26.—No. 13,603.

HADDAN, JOHN COOPE.—Hand rails for carriages and papier maché. This invention consists “in forming the hand rail  
“ for facilitating the getting on to the roofs of omnibuses  
“ and other carriages with a curve or bend between its up-  
“ right and its other portion, so that the hand may be slid  
“ from one portion to the other without leaving hold of the  
“ rail.” It also consists “in constructing hand rails for the  
“ above purposes with hinges or other contrivances, so that  
“ they may be laid down upon the roof or otherwise lowered  
“ when passing under gateways or at other times when  
“ required.”

The papier maché for carriage panels and other purposes is made by sticking together sheets of paper by marine glue or like substance. Pressure is applied and steam chambers or plates are added to set the glue. If the paper be too porous and absorb the volatile portion of the glue too rapidly it may be saturated with naphtha, coal tar or other suitable solvent before applying the glue.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1851, April 26.—No. 13,604.

LYALL, JAMES BAGSTER.—Carriages. The first part of this invention consists in so constructing omnibuses that the passengers sit back to back, the seats extending from back to front down the centre of the vehicle which is thus divided into two compartments. Each of the latter has its door and the privacy of the passengers may if desired, be secured by

means of partitions. The outside passengers sit face to face. Their feet are in a hollow over the seat of the inside passengers and their seats being elevated on the roof, afford head room to those inside.

A funeral carriage is described as similarly constructed, so far as the inside passengers are concerned, the space between them and below the seat being arranged as a receptacle for a coffin.

The invention also relates to the construction of a closed two wheeled cab, entered by a door near the front, so that the driver need not leave his seat to control the door.

It is proposed to construct these vehicles of T-iron framing filled in with thin plate iron, the seats and flooring being of wood.

It also relates to brakes which are described under several modifications. In one arrangement they are put in action upon the hinder wheels through chains which connect the horse collars with certain rods, springs removing the brakes when the horses again draw forward the carriage. They are also described as applicable to the front part of the hinder wheels, in which case the brakes are fixed without the use of springs on the horses resuming draught.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1851, May 7.—No. 13,624.

MELLISH, THOMAS ROBERT. — Ventilators and blinds for carriages, &c. These are made by arranging glass tubes, rods, or strips, either plain, coloured, or silvered, in frames, so as to form modified Venetian blinds which may be used also as ventilators.

Ventilators, or ventilating panes, are made by placing, side by side, a number of strips of glass having notches at intervals along their edges. These notches come together and so form holes in the built-up frame.

[*Printed, 7d. Drawing.*]

A.D. 1851, June 17.—No. 13,669.

HEPBURN, FRANCIS JOHN SWAINE.— Ventilating carriages. This invention consists in constructing carriages with a double roof, the inner roof being perforated or permeable to air. Spring valves establish a communication between the outer

air and the space between the roofs, and they are controlled by means of cords passing into the carriage. If more air be required valves in the inner roof may be opened. A valve is also fitted in the fore part of the carriage, under the front seat.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1851, August 5.—No. 13,710.

BISSELL, LEVI.—Springs. The springs described by this specification are made of wood, in some cases strengthened with metal. The wood is cut into the shape of the spring and then a number of saw cuts are made transversely across it, from the convex side nearly to the concave. These saw cuts are filled with wood, metal or other hard substance. When great weight is to be borne bolts or rivets are passed through the wood spring between each saw cut, for the purpose of preventing the breaking off of the semi-detached pieces. Moreover to strengthen the spring a steel or other metal strip may be bolted along the concave surface of the spring, and turned down over the ends. Various forms of springs are shown.

[*Printed, 5d. Drawing.*]

A.D. 1851, October 16.—No. 13,773.

ONIONS, WILLIAM.—Axles. This invention relates to the manufacture of a large number of articles including axles, by casting them from a mixture of two parts of Cumberland ore, four parts of steel, and ninety-four parts of iron, in iron moulds. They are then annealed by heating them while surrounded with powdered hæmatite, and so become malleable.

By a disclaimer, dated 14 April 1852, No. 13773,\* filed by Henry Vallance the assignee of these Letters Patent, so much of the invention as related to axles and certain other specified articles, was disclaimed.

[*Printed, 4d. No Drawings.*]

A.D. 1851, November 15.—No. 13,812.

SCOTT, WILLIAM CHARLES.—“Improvements in the construction of omnibuses and other public and private carriages.”

This invention relates in the first place to the two longitudinal and extending sitting places of the interior of the carriage, which are, according to this invention, each divided into

distinct compartments, “and thus each such individual seat  
“ is rendered completely independent, and, as regards the case  
“ and convenience of the occupant, entirely unconnected with  
“ the adjacent seats.”

Secondly, the invention relates more materially to the construction of the compartments and seats of the vehicle. A framework of timber combined with iron or other suitable material has attached to it the flooring or bottom of the body, as well as the panelling and other parts. Those parts of the framing which form the divided seats also support a second or false flooring, placed above the first or lower floor, the latter receiving the feet of the seated passengers, while the upper floor provides a covering and protection for the feet of such passengers against the tread of persons who may from time to time enter and leave the vehicle. The panels of the vehicle are formed of any suitable material, and of curvilinear figure, the convex sides being outwards, and the concave parts forming the backs of the passengers' seats. The lights or glasses are of curvature corresponding with the panels. On the outside of the vehicle seats are constructed for the accommodation of as many passengers as may be thought desirable, step ladders, hand rails, and other conveniences being arranged for facilitating the access and departure of passengers to and from the vehicle. The ventilation of the vehicle is provided for by means of tubes which are pierced with apertures, and by placing above each window suitable curved plates of perforated metal.

[*Printed, 10d. Drawing.*]

A.D. 1851, December 1.—No. 13,838.

GRAYSON, WILLIAM.—“An odometer or road measurer, to  
“ be attached to carriages for showing distances over which  
“ the wheels pass.”

The instrument which forms the subject of this invention  
“ consists of a train of wheel work with two dials and indexes  
“ to indicate the distance travelled. The mechanism is  
“ mounted on a metal plate and enclosed in a box which is  
“ affixed to some convenient part of the carriage, in such a  
“ manner that one dial may be seen from the outside of the  
“ carriage, so that previous to entering the carriage the pas-  
“ senger may examine the dial and have the index placed at

“ zero. The other dial must be inspected from the inside  
“ of the carriage, and is intended for the use of the proprietor  
“ and to serve as a check upon the driver, who will be ac-  
“ countable for the distance travelled as indicated or marked  
“ upon this dial after due allowance for back carriage. The  
“ mechanism or train of wheels whereby the indexes are  
“ actuated is set in motion by a pin, stud, or cam on the nave  
“ of one of the running wheels; this pin, stud, or cam, is at  
“ every revolution of the wheel brought against one end of  
“ a pendant lever which is thereby forced back, and its upper  
“ end made to act upon a ratchet wheel which forms part of  
“ the mechanism of the ‘odometer.’”

The details of the invention are very fully set forth.

[*Printed, 9d. Drawing.*]

A.D. 1852, March 8.—No. 14,010.

SCOTT, URIAH.—“Improvements in wheels, and in springs  
“ and spring bearings for carriages.”

That part of this invention which relates to wheels consists in “the application or interposition of vulcanized india-rubber, “cork, or other suitable elastic material, between the axle “boxes and the naves of wheels, so as to diminish concussion “and destroy or lessen vibration by the isolation of the boxes “in which the axles work.” The elastic material is placed between the ordinary axle box and an outer box or casing, and secured by flanges and a plate, certain leather washers preventing the material from being chafed by the metal.

As regards springs, the invention consists in casting, moulding, or otherwise forming india-rubber into stout, solid, or hollow pieces, “with projecting or enlarged portions at “each of their ends for affording a ready means of clipping “or holding them, and also in inserting in the said enlarged “portions pieces of metal or suitable substances for preventing “the said portions being pulled through the clips or other “arrangements for holding them.”

As regards spring bearings, the invention consists in “so “combining vulcanized india-rubber, or other suitable elastic “material, with a box or apparatus, to be used either with “or without ordinary or other springs for carriages, as to “destroy or lessen vibration by the entire or partial isolation of the parts employed to connect the axle with the

“ body or with the springs, or to connect springs with each other.”

Different modifications of these springs and spring bearings are set forth.

[*Printed, 9d. Drawing.*]

A.D. 1852, March 8.—No. 14,018.

HODGE, PAUL RAPSEY.—(*A communication.*)—Elastic wheels. The improvements comprised within this specification have relation chiefly to railway purposes, but one improvement is claimed as relating to common road carriages. This improvement consists in placing between the axle box and the nave of the wheel, whether the latter be of wood or iron, rings of vulcanized india-rubber. Inasmuch as between the nave and the box there is space sufficient for horizontal and vertical motion, a certain amount of elasticity will be gained by the interposition of the india-rubber springs, together with freedom from noise.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1852, March 18.—No. 14,025.

WHEATLEY, FRANCIS. — “ An improved safety cab omnibus.”

This invention consists in the first place of a mode of constructing a safety cab omnibus in which the inside seats for passengers are detached from each other by partitions of any known elastic material extending from each seat to the roof, such seats being so contrived the passengers sit with their faces towards the horses, a clear passage of easy access being left up the centre of the vehicle, and such passage being covered in by a semicircular glass roof. “ The ventilation is effected by interstices over the windows in each compartment, and by perforated light metal panels to the door of the omnibus, which opens at the end. Each person can stand upright inside before taking his seat, and can leave the omnibus without observation, or annoying his neighbour, whereby comfort and convenience are obtained.” The vehicle “ is lighted by night inside and out by means of ordinary lamps,” check strings being attached to an alarm, by which each passenger is enabled to have constant communication with the conductor.



The vehicle is arranged to carry ten inside and eight outside passengers, spring steps being placed on each side of the vehicle for the convenience of outside passengers.

[*Printed, 5d. Drawing.*]

A.D. 1852, March 20.—No. 14,028.

FROGGOTT, WILLIAM.—“A certain improvement or improvements in the process of decorative painting, which improvement or improvements are applicable to rooms, halls, carriages, and other purposes to which decorative painting has or may be applied.”

According to the first part of this invention carbonate of lead or zinc while in a dry state is ground down with spirits of turpentine, a portion of the spirit being afterwards allowed to evaporate by exposure, and copal body varnish being then added. The carriage or other surface is then coated with this mixture on one day, the operation being repeated on the following day, and afterwards from day to day “until a sufficient body is obtained for sustaining a good polish,” the quantity of varnish being increased with each succeeding coat. A white ground is thus formed, but any requisite colour may be obtained by the use of suitable pigments, and if the varnish is of good quality the mixture will dry and harden in three days sufficiently to enable a workman “to rub down any inequalities with pumice dust and rottenstone, and polish with the hand to a brilliant surface.”

“All work required for the coachmaker’s department will harden and be fit for polishing in one sixth of the usual time required for polishing upon varnish alone, and all the requisite colours or shades may be obtained in a state of purity by mixing the colour with the varnish, instead of laying three or four coats of varnish on the painted work, which now requires three or six months to enable the workmen to give a sufficient polish.”

The patentee mentions other processes, in one of which colouring substances are ground with spirits of turpentine and evaporated to dryness on paper, being afterwards mixed with a varnish made of gums dissolved in alcohol. And a sketch or design may be drawn upon paper and then cut out and placed upon the polished surface by needle points or other means. Common ground white lead, in oil, tinted as re-

quired, thinned with turpentine, is then stippled over the ornament, so as to produce a dead coloured ground, "leaving  
" the part intended for the ornament in all its brilliancy of  
" polish," such part being then painted as requisite.

The patentee states that he occasionally uses a solution of sugar, gum, gelatine, or starch, and lays in the ornament or design, the whole being then stripped over, and the surface, when dry, washed with water, which will bring off the stippling from that part of the surface which has been covered with the solution of sugar, gum, gelatine, or starch, thus leaving the ornament or design in bright relief.

[*Printed, 3d. No Drawings.*]

A.D. 1852, March 24.—No. 14,036.

PIDDING, WILLIAM.—Improvements in carriages. This invention chiefly relates to improvements upon the invention for which letters patent were granted to the present inventor on 21st Nov. 1846. That invention had relation partly to the construction of wheels for four-wheeled carriages, by the use of which the carriage was not required to lock over those in front, which could then be made as large as the hind wheels. The spokes of those wheels were not fixtures in the nave, but rocked on their ends "so as to form with the axle either an  
" acute or an obtuse angle," and were kept in place by means of springs. "As a substitute for these or in addition thereto" the first part of this invention consists in the employment of an elastic material for the spokes of wheels, "such as whale-  
" bone or other springy woods, steel or other springs," or a combination of these, in plates thinly laminated, and formed into a figure of the necessary section, "or in any way that  
" the combination may require," the spokes of such wheels being made elastic for a portion of their length only, two-thirds, three-fourths, five-sixths, or any other fraction of the length, as experience may dictate, the remainder of the spoke being rigid.

The second part of the invention consists in the application and addition of "catches" to the spokes of a wheel such as mentioned above, by which "a portion of the force exerted  
" by the springs of a fixed number of spokes, say, 3, 5, or  
" 7, is exerted at the same time in each spoke as it attains

“ its vertical bearing on the ground, thus rendering it more secure.”

Another part of the invention relates to a mode of constructing the nave “ by which friction is materially diminished, “ and compensation afforded for the wear and tear of the “ materials used,” the nave itself being composed of radiating metallic plates, in combination with plates of vulcanized india-rubber, and certain catches and receivers surrounded by an elastic ring of highly compressed india-rubber and furnished in the interior with friction rollers.

Another part of the invention consists in adapting axletrees of different lengths in such manner as to allow of the tires of divided tire wheels being brought nearer to the axletrees, and so facilitate the turning of vehicles provided with such wheels.

The invention also includes the use of a composition consisting of straw, grass, vegetable fibre, raw spent graves, sawdust, bran, dried leaves, fecula, “ manufactured mineral “ wire or plate when required,” chopped leather, resin, gutta percha, glue, gum, bitumen, or other similar binding substances, for the construction of the panels and other parts of railway and other vehicles “ not usually comprised in the “ word ‘ framing,’ ” or fecula alone may be used after being heated and compressed until it resembles horn, the parts of vehicles thus formed being coated and otherwise treated as may seem desirable.

It also relates to variations of his method of supplying endless rails for the wheels to run upon. Several modifications are shown. One consists of a rigid circular rail supported in a frame and run over by a number of friction rollers travelling around fixed guides. Another consists in substituting for the rigid rail a flexible rail or belt of india-rubber and metal alternately. Artificial heat and cold are applied at different parts to produce flexibility and rigidity. Similarly there may be used tubes containing fusible metal, resins, &c. which when heated become flexible and when chilled as the friction rollers run over them become rigid.

The invention also consists in applying the patentee's method of relieving horses from weight of postillions, described by his previous specification, to two-wheeled carriages.

[*Printed, 9d. Drawing.*]

A.D. 1852, June 12.—No. 14,165.

DIXON, EDWYN JOHN JEFFERY, and DODSON, ARTHUR JOHN.

—“Improvements in machinery and apparatus used in  
“quarrying slate and stone, and in cutting, dressing, planing,  
“framing, and otherwise working and treating slate and  
“stone, and in apparatus and waggons used for moving and  
“conveying slate and stone and improvements in joining,  
“framing, and connecting slate and stone.”

That part of the invention which relates to waggons consists, in the first place, in constructing such waggons “with-  
“out any under or ‘carriage framing’ upon which to build  
“up the waggon,” an iron plate forming the bottom of the waggon, there being underneath this two longitudinal beams, the ends of these beams projecting beyond the plate and serving as buffers, bands of iron being placed around the beams near such ends in order to strengthen them. To the lower sides of these beams are attached bushes for the reception of the ends of the axles, the bolts which secure these in their places passing through both beams and plate, and to the sides of the beams are attached iron loops, into which stauncheons enter, the latter supporting the sides of the waggon, the ends being sustained by other stauncheons which enter sockets bolted to the ends of the iron plate, a “draught  
“iron being also connected to the latter.” A truck may be constructed in a similar manner, the sides and ends being omitted, or a waggon may be at any time converted into a truck by lifting the stauncheons which support the sides and ends out of the loops and sockets already mentioned. In order to lubricate the axles each of the latter is bored at the ends so as to have an opening extending for some distance inside it, a hole leading from each opening to one of the axle bushes or bearings. Each opening has a “breech” screwed into it at the end of the axle, there being a hole through this breech of considerably less diameter than that of the opening, through which oil is squirted for the lubrication of the axle, the breech preventing its return. And if it be desired that the wheels shall be loose upon the axles, a second hole is made to lead from each opening in the axles for the purpose of conveying oil to the insides of the “boxes” or naves of the wheels. The latter are grooved so as to be capable of running

upon rails composed of round bars the waggons being apparently meant for travelling upon such rails.

The other parts of this invention, which are described at considerable length, contain nothing which requires notice here.

[*Printed, 4s. 6d. Drawings.*]

A.D. 1852, June 17.—No. 14,171.

NORTON, JAMES.—“Improvements in apparatus for ascertaining and registering the mileage run by public vehicles during a given period; also the number of persons who have entered in or upon or are travelling in public vehicles, part of which improvements is applicable to public buildings and other places where tolls are taken.”

This invention relates in the first place “to a mode of measuring the distance run by common street cabs, the object being to show the proprietors of such cabs the amount of work which their horses have performed in a given period whether profitable or otherwise, and also to apprise passengers of the distance they have been carried, and the amount of fare which they have to pay.”

This part of the invention is set forth in detail, and at some length, catches, ratchet wheels, springs, fingers, and other mechanism being mentioned as applicable in carrying out this part of the improvements. The length of the description of this part of the invention, however, precludes even an outline of it from being given here. The invention includes the application of a turnstile or other similar apparatus to the door of an omnibus, which will not only show the number of passengers who have travelled both inside and outside the vehicle from time to time during the day, but also show at any given time the number of passengers within the omnibus. Arrangements are described by which the steps of the vehicle are made to register the entry or departure of passengers therefrom, the floor of the vehicle itself being in some cases made to serve a similar purpose, being moveable, and the pressure of the passenger's foot causing it, or a part of it, to act upon the indicator.

[*Printed, 4s. 1d. Drawings.*]

A.D. 1852, June 18.—No. 14,173.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—"Improvements in the manufacture of wheels, tyres and hoops."

One part of this invention consists in "manufacturing tyres and hoops, each tyre or hoop being formed from one bar or piece of cast steel, without weld or joint."

A mode of applying the invention to the construction of the tires of wheels suitable for railway purposes is described, in which an ingot of cast steel is first subjected to a forging or hammering process by which it is rendered tough and compact, the ends of the ingot or bar being at the same time brought into an enlarged and circular form. An anvil having in it a suitable recess, is then used to give to the bar a form resembling the section of a double tire, there being a flange formed on each side of the bar and the two circular ends of the latter have then each a hole drilled or punched into it; and the bar is then cut or split by suitable means along the centre from hole to hole and the circular ends are hammered in order to harden and compress the metal at those parts, having been previously somewhat expanded, and the corners of the openings of the holes leading into the cut or slot in the bar being rounded off. The slot is then widened by the use of wedges or keys and the bar is then placed in what the patentee terms a "drawing frame," in which what are called "hooks" are used to draw the bar into a form approaching that of a circle, these "hooks" being inserted into the slot in the bar, and one being moved away from the other by means of a rack and gearing, or both being moved, so as to distend the two sides of the bar, this distension having been carried to as great an extent as may seem desirable, the bar is finally brought into a circular form by the use of anvils, hammers and segmental pieces, which may be moved rapidly by screws or wedges, being lastly turned in a lathe. A tire thus formed may be placed upon the arms of a wheel by any of the ordinary processes.

Another mode of carrying out the invention is described in which an ingot or bar, after being slotted and distended as mentioned above, is finally brought to the requisite circular form by rolling instead of hammering. In this case, however,

no flange is formed upon the bar until it arrives at the rolling process, the flange being formed during that operation.

The invention is described at considerable length all the details being minutely set forth, and the invention also embraces a mode of forming small and light tires "in duplicate" by forging a hoop of twice the necessary width, rolling it to the proper form and then dividing it into two by cutting it in a lathe. Either flanged or plain tire may be produced by this invention, and tires suitable either for railway purposes or for carriages for common roads, and hoops may be thus produced in the circumference of which teeth may be cut by ordinary means and toothed wheels of steel thus formed.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1852, July 31.—No. 14,249.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Wheels.

The invention comprises "three principal features, besides "various secondary matters of minor importance," and it "consists, firstly in the employment of an axle of the same diameter throughout its length, and having projecting shoulders at each end, with other shoulders which bear against the inner ends of the axle boxes. Secondly, of an axle box which is constructed in two equal halves or parts, these, when placed together, completely embracing the axle and keeping the wheel in its place, such axle box being provided with a chamber which encloses the inner shoulder of the axle, and serves as a receptacle for oil to lubricate this shoulder and the adjacent parts. Thirdly, in forming the nave of the wheel of cast iron or other metal, and constructing it in such manner as to receive and hold wooden filling pieces between the spokes, whereby the latter are held firmly in their places, the tenons of the spokes being thus prevented from being so soon deteriorated and thrown out of their chambers or mortices by reason of the expansion of the metallic parts, or of their own contraction and expansion from changes of temperature. These wooden filling pieces are secured in their places by metallic bands, being, moreover, slightly enlarged inwards, which renders them more firm.

The secondary objects relate, in the first place to the form

and arrangement of certain screw bolts, whereby the back part of the metal nave is closed and the axle fixed therein. These bolts are formed with **T**-shaped heads, which are let into holes in the nave and covered by a ring, the bolts themselves drawing a metal ring and leather disc tightly against the nave.

Another secondary part of the invention relates to the form and arrangement of a screw plug which closes the front part of the nave or axle box but which may be removed for the purpose of supplying oil thereto, such plug being screwed into the centre of the nave or axle box the front of which forms an oil chamber, and the plug having a large disc like head, behind which is apparently a leather washer. A third point relates to the employment of a certain band by which two halves of the axle box are held together, this band being held in place by the metal ring and leather disc and **T**-headed bolts mentioned above.

[*Printed, 9d. Drawing.*]

A.D. 1852, October 19.—No. 14,329.

NEWTON, WILLIAM EDWARD. — (*A communication.*) — “Improvements in machinery or apparatus applicable to public carriages for ascertaining and registering the number of passengers who have travelled therein during a given period, and the distance each passenger has travelled.”

The apparatus which forms the subject of this invention will shew the time when any person entered the carriage, when he got out, and how long he remained inside. It will also indicate the time when the carriage commenced running, when it stopped, how long it ran, and how long it stopped. The mark shewing the presence or absence of passengers in the vehicle is produced by means of pencils, or marking instruments, which are equal in number to the number of compartments in the carriage, and are sustained and guided by helical springs, which keep them to their work and in contact with a travelling paper or other surface on which they are made to mark. These pencils are actuated by the spring seats of the carriage, from which motion is communicated by means of a wire or cord which passes under the seats, and is attached to rods in connection with



“ the pencils. These pencils follow the movements of the  
 “ seats to which they correspond, and which are depressed  
 “ when they are occupied, and rise again when empty. The  
 “ second mark, showing the time of running and stoppage of  
 “ the carriage, is produced by means of a pencil or marking  
 “ instruments attached to a rocking lever, one end of which  
 “ terminates in a coiled spring fixed to the box which encloses  
 “ the various parts of the mechanism, and carries at its other  
 “ extremity a metal roller of sufficient weight to counter-  
 “ balance the force of the spring, and maintain the lever in a  
 “ horizontal position. The slightest movement will suffice  
 “ to disturb the equilibrium, and cause this lever with the  
 “ pencil to oscillate within certain limits determined by two  
 “ stops. The points of all the pencils are caused to press  
 “ upon a band of paper wound round the cylinder, and upon  
 “ which it is held tight by a bridle piece. This band of paper  
 “ is caused to unwind off the cylinder, and pass over a table  
 “ in contact with the pencils, by means of a second cylinder  
 “ or roller, to which motion is communicated by means of a  
 “ suitable gearing set in motion by clockwork, and upon this  
 “ second cylinder the paper band is wound to a certain dis-  
 “ tance every hour after having received the marks from the  
 “ pencils.”

The invention is set forth at great length, the description being illustrated by various elaborate drawings.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1852, November 25.—No. 14,347.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—(*A communication.*)  
 —Springs. This invention consists, first “ in a new arrange-  
 “ ment of springs of caoutchouc, applicable to the suspension  
 “ of wagons, coaches, and other carriages.”

Secondly, “ in the employment of the same springs of  
 “ caoutchouc for obtaining elasticity necessary for the cushions  
 “ of carriages, chairs, &c.”

Thirdly, “ in the employment of the same springs for  
 “ facilitating the traction by horses and other animals.”

The essential feature of the invention consists in the use of washers or rings of india-rubber enclosed within a cylindrical case and having interposed between them washers of metal,

this apparatus being connected with tubes, rods, hooks, links, and other mechanism according to the purpose for which the spring is to be used the invention being described under a great variety of modification.

[*Printed, 10d. Drawing.*]

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## PATENT LAW AMENDMENT ACT, 1852.

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A.D. 1852, October 1.—No. 31.

LEE, JOHN DUNKIN.—Covering vehicles. Instead of pulling the cover or macintosh over hoops as usual, the inventor arranges a number of parallel bars or rods with eyes at their ends which run on arched rods. The cover travels on and with these bars which are pulled up by a rope and pulley or levers.

[*Printed, 5d. Drawing.*]

A.D. 1852, October 1.—No. 43.

POOLE, MOSES.—(*A communication from Mr. Goodyear.*)—India-rubber horse and carriage furniture. This invention consists in the application of a compound of india-rubber to the construction of parts of carriages, such as dasher irons, &c., and to the manufacture of harness. The compound consists of two parts of india-rubber incorporated with one part of sulphur and moulded or otherwise treated at a high temperature.

The patentee refers to the Specification of a previous patent granted to Mr. A. V. Newton on behalf of the present inventor, by which it was proposed to use the present material in combination with metal work, and he now explains that such metal work may, if desired, be dispensed with.

[*Printed, 3d. No Drawings.*]

A.D. 1852, October 1.—No. 59.

DAVIS, MARCUS.—Carriages, wheels, axles, &c. This invention relates to a number of improvements including the following:—

Wheel spokes are made of metal tubing of various sections, secured in the nave by screwing or by casting the latter on to their ends or otherwise, and in securing them they are arranged at an angle in order to “dish” the wheel. The hollow spokes may be used as lubricators to the axle and a method of adapting them for this purpose is described.

The periphery of the wheel may be made of tubing bent to the proper form and faced with steel or horn or covered with india-rubber. Or it may be made up of bar iron so arranged that the narrow part or edges shall form the running surface. For light carriages one rim only is used, for heavy vehicles two or more are employed. Various methods of applying the india-rubber or india-rubber fabric, are set out.

For large wheels, to give strength, rings or bars of metal are used to tie the spokes, about midway of their length.

The axletree is made tubular and “shoulders for the wheels to bear against, sockets for the wheels to run on, and squares for the springs or spring flaps to lie on, are moulded from a pattern, and the tubular arm being laid in a channel crossing the mould, metal is poured therein, and in cooling “adheres to the tubular arm.”

The springs are curved into a worm or volute, and if made singly may be curved round the axletree.

The nave of the wheel is bushed with metal and fitted with washers, tubes, or rings of india-rubber supported by steel, or they may be fitted with horn bushes.

The shafts and framework of the carriage may be made of metal tubing and the rest of the body may be constructed of sheet metal alone or combined with wood or leather. To prevent vibration the tubular spokes and other parts may be stuffed with cotton, &c.

The invention also relates to improvements on “Davis’s measuring and indicating cab,” and these consist in arranging the seat or flap which works the apparatus and also in contriving it so that if the fare should have occasion to

leave the cab before the journey is completed the indicator will not work so as to mislead. The inventor also arranges a moveable cover to the driver's seat for wet weather, and also a heating apparatus.

[*Printed, 9d. Drawings.*]

A.D. 1852, October 1.—No. 89.

MARSHALL, JAMES NICHOLS.—“An improved wheel for  
“carriages and other vehicles.”

The following is the patentee's description:—“First, an  
“improved perpendicular wheel for carriages and other  
“vehicles, on the scale of five feet, made of wood, with an  
“iron cog tire.”

“Second, twenty wooden rails attached to an iron plate,  
“with cogs to fit the cogs of the tire on the wheel, each nine  
“inches long, to girt the wheel, three inches deep, and the  
“same width as the iron tire. The rail has a steel bolt, with  
“a pivot on each end, fixed in the centre, working in two  
“steel collars bolted each side of the tire. These collars  
“leave room for the rail and revolvers to lay flat on the  
“ground, and by them are carried round the wheel and kept  
“firm in their places. An iron pivot passing through the  
“wooden rail is fastened to the steel bolt in the centre for the  
“rail and wheel to turn on the revolver, there being as many  
“revolvers as there are rails. The revolvers are turned,  
“twenty-seven inches girt, horizontal top and concave  
“bottom, with iron bands. The pivot from the rail passes  
“through the centre of these revolvers, is screwed on the  
“rail, and acts jointly with the rail and wheel. These re-  
“volvers may be made either of iron or wood, the wood  
“acting better for a plough, &c., and the iron for the com-  
“mon road.”

[*Printed, 3d. No Drawings.*]

A.D. 1852, October 1.—No. 97.

DUNLOP, JOHN MACMILLAN.—Wheel tires. This invention consists in making the wheel or the tire only of cast iron, decarbonised and softened by annealing. An undercut groove is made in the tire into which is placed a tire or ring of india-

rubber. The latter is held in its place by means of pins passed through it, their ends abutting under the undercut sides of the groove.

[*Printed, 5d. Drawing.*]

A.D. 1852, October 1.—No. 106.

ALLAN, THOMAS.—Wheels for carriages, &c. The inventor makes the spokes of C springs or volute springs fixed at one end to the nave, at the other to the tire. “The tire might also  
“ be composed by continuing the spring spokes in length,  
“ and bending the super-requisite lengths into a circular  
“ form, and then encircling the whole with an outer tire of  
“ vulcanized india-rubber, solid or tubular, or other elastic  
“ substance. In the case of a locomotive for common roads  
“ this construction of wheel would take a greater grip of the  
“ ground.”

The improvement is “based on one general principle,  
“ namely the using of the spring as the retainer, accumulator,  
“ and transmitter of the full force of the power applied, thus  
“ overcoming that rigidity of impulse which necessarily  
“ pervades all applications of power against a rigid ful-  
“ crum.”

[*Printed, 4d. No Drawings.*]

A.D. 1852, October 1.—No. 135.

GRIFFITHS, ROBERT.—Indicating number of passengers and distances travelled. According to one part of this invention an indicator put in motion by the wheels of the carriage records the progress and at the same time causes a series of pockets or receptacles to move forward. Each pocket has been previously supplied with its proper tickets, and as a passenger enters the carriage he is given a ticket from the pocket that is open. This ticket will show where the passenger entered, and on leaving he gives it up to the conductor, who, on referring to the indicator, learns the distance travelled. The ticket when done with is placed in another pocket open at the time and thus affords the proprietor a means of ascertaining what tickets have changed places and what distance has been run.

Another indicator is shown which is worked by the con-

ductor. It also has the tickets and pockets. It has a dial marked with the stages of the route, which dial is moved forward by the conductor at the proper moment, the movement ringing a bell. He gives a ticket from the pocket open at the time and places it when done with as in the former indicator.

The third part of the invention consists of an apparatus "having a series of slides equal to the number of passengers the vehicle is intended to carry; each of these slides is numbered or lettered, and having a series of tickets marked with corresponding letters or figures, so that the conductor gives to each passenger a ticket on entering the vehicle, and at the same time puts into gear the slide with the corresponding number, which then travels when the vehicle is in motion, so that the passenger is able to see by referring to the indicator, on leaving the vehicle, the distance he has travelled."

[*Printed, 1s. 4d. Drawings.*]

A.D. 1852, October 2.—No. 183.

GREEN, THOMAS, junior. — (*Provisional protection only.*)—Omnibus. The roof is raised in the centre from end to end to allow of passengers walking upright in the vehicle, and cornices are attached to the sides to serve as hand rails. Ventilators are also fitted in the sides of the raised part of the roof, the windows of the vehicle being fixtures. The front of the omnibus is convex and the seat takes the same shape and so gains in length. The large springs for the hind wheels are attached by one end only, the other sliding through guides. By this arrangement back springs are dispensed with, the tendency to sway is diminished "which admits of the diameter of the body being increased without increasing the span of the wheels." A small additional springs sustains the weight of an unusually heavy load. A vertical bar with step pieces supplies the means of access to the roof. The front part below the footboard falls back to allow of the horses being brought nearer to their work and the slides are recessed to allow the front wheels to run under the body. A foot brake is supplied to the driver.

[*Printed, 5d. Drawing.*]

A.D. 1852, October 4.—No. 196.

ANDERSON, SIR JAMES CALEB.—(*Provisional protection not allowed.*)—"Improvements in locomotive engines and the "carriages drawn by them, part or parts of such improvements being applicable to other purposes."

This provisional specification contains the heads of a number of inventions, including the following, comprehended by the present series of abridgments:—Rendering exhaust steam invisible and condensing the same; arranging the machinery of locomotives; a strap or band of gutta-percha, india-rubber or leather "to be used either singly or combined with chains, wire, hempen or leather ropes or bands, "for the purpose of transmitting motive power to driving "wheels;" increasing draught in chimneys; increasing friction of wheels; checking number of passengers; guiding trains of carriages on common roads.

[*Printed, 3d. No Drawings.*]

A.D. 1852, October 4.—No. 198.

BATES, EDWIN.—(*Provisional protection only.*)—Brake. This invention relates to the application of resistances, such as by springs, inclined planes, weights, elastic bands, &c. to brake wheels.

The drawing also shows such a wheel attached to the end of a lever which swings under the carriage and so that when let down by releasing a cord or chain, the wheel comes in contact with the ground and presses upon it at an angle.

[*Printed, 6d. Drawing.*]

A.D. 1852, October 6.—No. 260.

FULLER, WILLIAM COLES, and KNEVITT, GEORGE MORRIS.—Springs. These improvements consist "in the use of india-rubber or other similarly elastic substance in any of the "following methods, viz. :—

1. "Keeping the axle of a carriage in its proper position by "means of upright bolts acting as axle guards, on which an "india rubber ring or rings work as a spring, the bolts being "made to pass through sockets of wrought or cast iron, or "hard wood, which are firmly bolted or secured to the axle "or axle bed."

2. "Keeping the axle in its proper position by means of a front stay iron working in a lug or scroll iron, and a tie rod behind working in a similar scroll iron, the india rubber being applied to work on a perpendicular bolt or bolts."

3. "Keeping the axle in its proper position by means of an elliptic bow or stay iron with double tie rods and a joint or joints in the centre; the india-rubber rings being applied perpendicularly as aforesaid."

4. "Keeping the axle of the fore carriage in its proper position by means of four or more upright bolts on which the india rubber rings work as aforesaid."

5. "A jointed lever spring, with the india rubber rings placed horizontally over the axle."

6. A similar spring with the rings "placed horizontally below the axle."

7. "A jointed lever spring having compensating power, with the india rubber rings placed horizontally above the axle."

8. "A jointed lever spring, with the india rubber rings placed perpendicularly above the lever."

9. "An improved lever spring, with the india rubber rings placed perpendicularly below the lever."

10. "An improved check spring consisting of one or more rings of india rubber with iron guides, to be used in combination with steel springs or other side springs."

11. "An improved elastic shackle with one or more india rubber rings, to be used in combination with steel springs or stay irons."

12. "An improved suspension spring consisting of india rubber bands, to be used separately or combined with the iron work described as 1st, 2nd, 3rd, for the purpose of securing the axle in its proper position."

The invention relates to improvements on No. 10,894, A.D. 1845.

[*Printed, 10d. Drawings.*]

A.D. 1852, October 8.—No. 300.

CRESTADORO, ANDREW.—Constructing and propelling vehicles. This invention relates to many improvements.

1. A method of propelling vehicles by animal power. The animal stands on what is called "endless ground" and by the



motion of its feet as if walking causes the "endless ground" to move round drums and communicate motion through variable gearing to the driving wheels. One of the latter is loose on its axle to facilitate turning. The carriage is steered from the front.

2. Springs for buffers and other carriage purposes. They are made up of corresponding rods and india-rubber rings. "Double-acting buffers" are made by attaching two single buffers back to back, their rods being converted into one. "Four acting" bearing springs are described as being constructed of "four distinct buffers attached together as to form" "one solid piece, the axle of the wheels to be the centre," each of the four rods or surfaces acting separately. One part supports the carriage as usual, one on each side of the axle bears against the framing and the fourth, through which the axle passes, serves to guard against concussion on the wheels, such as on railways arises from the grinding action of the flange on the rail.

3. Brakes for carriages, acting on the ground between the wheels by rollers.

4. Connecting two-wheeled vehicles with the main propelling vehicle by means of T pins and buffers and guiding the train of carriages so made up.

5. Supporting long waggons or carriages on bogies, an improvement apparently intended for railway purposes.

[*Printed, 10d. Drawing.*]

A.D. 1852, October 13.—No. 361.

OATES, JOSEPH PIMLOTT.—India rubber springs.—This spring consists "of a series of rings or bands of vulcanised caoutchouc" "placed upon two rods or axes and held between plates" "received upon the said axes. When the said spring is used" "for carriages, the body of the carriage is hung on the lower" "axis, and the upper axis is attached to the frame of the carriage." The rings may be circular or elliptical or otherwise. They are placed side by side, so that the planes of the rings are perpendicular to the two axes. The rings may also be made by cutting lengths of india-rubber piping of different diameters and these rings are arranged concentrically. This spring operates by the extension and contraction of the rings themselves; not by mere compression of the mass of the caoutchouc.

The inventor also proposes to surround the pins to which the spring shackles are fixed with india-rubber sleeves, or to line the shackle itself with india-rubber. By these means he obviates vibration.

[*Printed, 6d. Drawing.*]

A.D. 1852, October 14.—No. 389.

WEBSTER, JAMES.—Springs. This invention consists in constructing springs by bending flat or other shaped bars or plates of steel to and fro so as to form angles or bends in opposite directions, “leaving a space between each bend of a width depending on the play the parts of the spring shall have before they come together, and no longer admit further compression.”

[*Printed, 5d. Drawing.*]

A.D. 1852, October 19.—No. 438.

HARCOURT, JOSEPH, and HARCOURT, WILLIAM.—*Provisional protection only*). “The application of porcelain, glass, or earthenware to articles in which or for which those materials have never heretofore been used.”

The provisional specification simply appropriates the application of the above material, to various constructions, among which are “certain descriptions of handles for carriage doors, knobs for gig aprons, studs for carriage doors, stops for the same, carriage window slides, stud plates for the same, caps for axle boxes, blind string studs,” &c.

[*Printed, 3d. No Drawings.*]

A.D. 1852, October 30.—No. 573.

BIRD, EDWARD, and WELCH, EDWARD.—(*Provisional protection only*).—“An improved cart or vehicle.”

“These improvements in a cart (which will be extremely useful in the colonies) consist, first, in placing the seat of the driver behind the body of the cart, by which arrangement he will be able to protect the property conveyed from injury or theft better than in a vehicle of the old construction, and parcels, letters, bags or other matters can readily be delivered without the driver leaving his seat. Secondly, in the addition of one or more swivel guns fixed on the

“ vehicle when gold or other precious merchandise has to be conveyed. And, lastly, in lining the vehicle with gutta percha or other substance impervious to water.”

[*Printed, 3d. No Drawings.*]

A.D. 1852, November 5.—No. 641.

HALL, COLLINSON.—“ An apparatus to be used in the carriage of solid and liquid bodies.”

This apparatus consists of a cask or drum mounted upon an axis and having round it a pair of discs on tires which run upon the ground and serve as wheels or bearers. The axis works in bearings in a frame which surrounds the whole and to which shafts are fitted for horse traction. A train may be made of these carriers which is to be drawn by a traction engine. A belt from the engine passes round the drums of the carriers and so propels them.

Various applications of the invention are mentioned, such as the carriage of roots, grain, gunpowder, liquid manure, sewage, street sweeping, &c. For the purpose of distributing liquid manure or water, a syphon is passed into the drum through the axis. This syphon draws out the liquid into a distributing trough placed behind the drum.

[*Printed, 7d. Drawing.*]

A.D. 1852, November 8.—No. 671.

WALKER, GEORGE JAMES.—(*Provisional protection only.*)—Gigs. This invention consists in so constructing carriages of the gig pattern, that two extra seats may, if desired, be temporarily added in rear. These seats are arranged as in a waggonette and are reached by a door from the back. The front seat is made moveable so as to adjust the weights. Extra bearing springs are fitted which, when in action, bear on friction rollers on the axles.

[*Printed, 5d. Drawing.*]

A.D. 1852, November 8.—No. 678.

Longbottom, Robert Isaac.—(*Provisional protection only.*)—“ Preventing vibration in railway and other carriages, and in axles.”

The inventor proposes to “ surround the axle, the arms,

“ and the boxes of carriages with felt, vulcanized india-rubber,  
“ or other suitable non-conducting medium, whereby the  
“ sound consequent on vibration is absorbed, and vibration is  
“ prevented from being communicated to the axle and also to  
“ the body of the carriage. Crystallization of the axles will  
“ thus generally be entirely obviated.”

[*Printed, 3d. No Drawings.*]

A.D. 1852, November 9.—No. 682.

NEWTON, MARK.—(*A communication.*)—(*Provisional protection only.*)—“Certain improvements in the construction of carriages,  
“ and in the means of preventing the overturning of the same  
“ when horses take fright.”

These improvements relate, firstly, to “suspending the  
“ boxes of all kinds of vehicles having two, three, four or any  
“ number of wheels by means of springs.” The inventor  
thus describes his invention:—“For suspending the boxes of  
“ two-wheeled vehicles I propose to fix two straight springs,  
“ crossed on the surface of the axle-tree near the wheels by  
“ each of their strongest extremities, so that the box may rest  
“ on the most flexible ends of the springs; and in order to  
“ support the box both in front and behind I fasten a curved  
“ spring to the centre of the axle-tree, and perpendicularly to  
“ it, the foremost extremity of which spring is fastened under  
“ the front of the box, and the other end is fastened under  
“ the servant’s seat behind. The means of putting the horses  
“ to the carriage may be in the usual manner, or instead of  
“ the ordinary shafts may be used the shafts, cross tree, &c.,  
“ formed whole of prepared iron connected to the axle-tree,  
“ and perpendicularly fixed to the centre of it, and also two  
“ ends of shafts fastened by bolts into two forks placed on  
“ each side of the carriage. In this case the steps are fixed  
“ on to the box itself. Another method of suspending a box  
“ of a two-wheeled vehicle is to fix a long-curved rod of pre-  
“ pared iron to the centre of the body of the axle; this rod  
“ will follow behind the outside of the box, and will end at  
“ its upper extremity by a spring about 18 inches long  
“ fastened to the extremity of the rod by bolts and a collar.  
“ To the flexible end of this spring will be fastened at the  
“ middle, by suitable means, a cross spring to the centre of  
“ the top of the box by means of two iron beams concealed by

“ the trimming, and running from the shafts of the box ;  
“ these latter will be fastened by means of bolts uniting the  
“ upper ends of each beam to each of the ends of the cross  
“ spring. As regards gigs and other carriages where the  
“ boxes are very short the process of fastening the back part  
“ of the curved spring to the middle of the axle-tree may be,  
“ dispensed with ; in such a case the front part of this spring is,  
“ fastened to the body of the axle-tree in the same manner as  
“ before described. In these methods I regulate the oscillat-  
“ ing motion of the box by means of a flexible sheet of steel,  
“ so as not to prevent the springing motion of the box in any  
“ way ; the centre of the said sheet of steel is fixed under and in  
“ the centre of the bottom of the box, and each of its ends  
“ fixed by suitable means to the shafts in front, and behind to  
“ the long rod, in the first instance, and to a cross rod in the  
“ second. With reference to four-wheeled carriages, the  
“ adaption and arrangement of these springs are similar to  
“ those in two-wheeled carriages. As regards three wheel  
“ carriages, it is necessary to state that a semicircular  
“ seat placed in the bottom of the carriage, and capable of  
“ accommodating three persons, is arranged so that the weight  
“ of such persons simply bears on the back axle, and esta-  
“ blishes a kind of equilibrium with all objects placed in front  
“ of this axle ; thus the weight of a fourth person equally  
“ seated in the inside of the carriage on a front seat, and that  
“ of the coachman, also seated in front and on the outside, are  
“ nearly neutralised. I now adapt a third wheel in front, and  
“ in the middle of the width of the box ; this wheel being  
“ nearly of the same size as the ordinary ones ; by such ar-  
“ rangements I cause the weight to be more equally distributed  
“ over the body of the vehicle, and diminish the amount of  
“ friction usual in such carriages to (at least) one half ; thus  
“ the keeping of such a vehicle is far less expensive, and the  
“ labour of the horses considerably reduced. I propose also  
“ to mount the vehicles called omnibuses in a similar manner  
“ upon three wheels ; the two hind wheels may be fastened by  
“ their axle to two nipping springs, or in the usual manner  
“ by springs fastened to the middle of the body of the axle.”

The invention also relates to a method of strengthening wheels by substituting for the spokes, circles of tempered steel the felloes being compressed between two iron circles.

A method of disengaging runaway horses is also described. The traces have eyes which are held in holes in the splinter bar by pegs which may be removed by the driver at will. The pole chains are attached to a pyramidally shaped block which fits into a shoe fitted to the pole. A weak strap holds the block in its place; and if any forward strain be put upon it it becomes free at once. A method of stopping the carriage is mentioned but not described.

[*Printed, 3d. No Drawings.*]

A.D. 1852, November 12.—No. 723.

HENWOOD, DANIEL. — Registering passengers. For this purpose a platform is fitted to the back of an omnibus and is so arranged as to afford as many ways of entrance into the vehicle as there are different rates of fare. Each entrance is closed by a vertical swivelling or radial bar. The conductor's place is in the centre and behind him as a passage to the roof. To enter the vehicle a passenger must move the bar or pillar opposite the entrance appropriated to the particular rate of fare he will have to pay. This movement will be registered on a dial, there being a dial to each pillar. A pillar and dial are also fitted to the door of exit.

[*Printed, 1s. Drawings.*]

A.D. 1852, November 15.—No. 760.

GOODMAN, JOHN DENT.—(*A communication.*)—Axle boxes.  
 “ The invention consists of employing an inner box, which  
 “ is made of two or more parts, which when together embrace  
 “ the axle, which has either a projection or a groove around it,  
 “ the inner box having a groove or projection to fit those of  
 “ the axle, and the outer end of the axle is supported by the  
 “ end of the inner box. The inner box fits into the outer  
 “ box, and is drawn into and retained in it by the aid of  
 “ a screw and suitable nut or nuts.”

[*Printed, 6d. Drawing.*]

A.D. 1852, November 22.—No. 818.

HEDGES, WILLIAM.—“ Improvements in carriages.”

“ The object of the invention is to construct a light and  
 “ convenient two-wheeled carriage, to contain four persons

“ comfortably, and a moveable seat for a person to drive from the interior. The wheels are on a cranked axle, the entrance into the carriage is from behind, and the driver’s seat is behind. In these particulars, however, the carriage is similar to what has before been proposed, but the carriage is capable of being used as an open or closed carriage, there being a large window in front, and one on either side. The front uprights or frames are capable, when the windows are down, of folding back, and part of the roof of the carriage is made to slide or move back. The fore part of the carriage is arranged to receive two shafts for one horse, or a pole and apparatus for a pair of horses.”

[*Printed, 5d. Drawing.*]

A.D. 1852, November 26.—No. 883.

MASSINGHAM, WILLIAM. — “ Improvements in carriages and apparatus for carrying the dead.”

The coffin is placed on a covered frame which is fitted with handles by which it may be carried. It is also fitted with bands or straps and rollers worked by screw gear by means of which the coffin is lowered into the grave, the frame having previously been placed over it. This frame is borne upon a hearse, and has small wheels which run on rails fixed on the latter. The coffin may also, if desired, be lowered through an opening in the bottom of the hearse. The hearse has handles at the sides by which it is propelled or it may be drawn by a horse.

[*Printed, 7d. Drawing.*]

A.D. 1852, December 3.—No. 939.

NEWALL, JAMES.—Brakes. The brake blocks are so arranged that if the end of the long lever attached to the rocking shaft which works them, be released or allowed to drop the blocks will be pressed against the wheels and there held until the lever be lifted. To the end of this lever is hinged a vertical rod. Upon this is a spiral spring which is put into compression when the rod, and consequently the lever, is raised. The raising is performed by a pinion working on a rack on the rod. To put the brake on a catch or detent is released and the spring immediately operates.

The specification also describes a method of connecting a series of such brakes in a railway train.

[*Printed, 6d. Drawing.*]

A.D. 1852, December 10.—No. 1018.

SMITHSON, THOMAS ABBEY, and ADAM, GEORGE HALL.—(*Provisional protection only.*)—Suspending carriage bodies. Instead of springs the inventors propose to make use of elastic straps or bands. These are attached by their lower ends to bars passing through scroll irons fixed on the carriage. The other ends are fastened to horizontal bars carried by vertical rods attached to the fore carriage and the hind axle respectively. To the under side of the scroll irons are attached forked guides, projecting downwards, for the purpose of receiving the axle which is allowed to play up and down therein.

[*Printed, 3d. No Drawings.*]

A.D. 1852, December 16.—No. 1074.

PAYNE, JOHN JEREMIAH.—(*Provisional protection only.*)—"An improved axle in two parts."

"The axle is formed or consists of two parts parallel to each other, and nearly meeting in the centre of an iron plate, which is above the axle between the wheels, to which iron plate such two parts are fitted by means of four bearings secured by bolts and nuts; two of such bearings being fitted at the two ends of the axle near the centre of the iron plate between the wheels, and the two other of such bearings being secured in like manner to the ends of the iron plate near the inside of the wheels. The wheels are fixed to the axle, and are enabled to revolve independently of each other, and, by means of springs so arranged as to be fitted with bearings on the ends of the axle outside the wheels, and one on each end of the iron plate and bearing inside the wheels, will give a more equal weight on the axle, thereby adding to its safety, and producing a more easy and direct draught to the carriage, and at the same time will allow the body of the carriage or other vehicle being built so as to extend over the wheels, and thus permit not only of greater width in its construction, but also, by giving in-



“ creased space in the interior, will add considerably to the  
 “ comfort and accommodation of the passengers and other  
 “ persons using the same.”

[*Printed, 3d. No Drawings.*]

A.D. 1852, December 24.—No. 1157.

BURCH, JOSEPH.—“ Improvements in passenger and other  
 “ carriages.”

The invention consists firstly in linking together a train of two-wheeled wedge-ended carriages. The links are at the top and bottom of the wedge at each end and this wedge shape facilitates turning. The doors are placed in the faces of the wedge and beneath, between each pair of carriages, is a circular platform or step, supported by and moveable in brackets. The hinges or links are so contrived as to allow for the action of the wheels or uneven ground. The carriages may be fitted according to class, and outside seats, covered by a roof or awning, are provided.

Each carriage is also fitted with “ vertical steel, india-  
 “ rubber, or other springs between the axletree and the car-  
 “ riage body,” and “ horizontal drawing links ” are used “ for  
 “ connecting and transmitting the draft from the carriage  
 “ body to the axle, and also for the purpose of preventing any  
 “ lateral strain upon the vertical springs.”

[*Printed, 7d. Drawing.*]

A.D. 1852, December 24.—No. 1162.

WILSON, JAMES GODFREY.—(*Provisional protection only.*)—  
 Wheel tires and carriages.

This invention relates—

Firstly, to the use of tires made of whalebone ;

Secondly, to the ventilation of carriages by making a space between the roof and the lining, which space communicates with the interior by fine perforations ;

Thirdly, in making the panels and roofs of carriages of gutta percha moulded on a body of wire or wire netting ;

And, lastly, to an arrangement of brakes for railway purposes.

[*Printed, 3d. No Drawings.*]

A.D. 1852, December 24.—No. 1163.

NEWTON, ALFRED VINCENT.—(*A communication.*)—"Obtaining and applying motive power."

According to this specification the patentee proposes to utilise the weight of a carriage in its own propulsion. For this purpose he supports the carriage upon its wheels by the interposition of friction rollers which run upon the axles. When the carriage is drawn forward by the usual tractive force the friction rollers move out of the vertical line, so that the force of gravity of the superincumbent body is made to act upon the axle at an angle to the vertical line and "thereby cause or assist in causing such axle to rotate." An angle of three-and-a-half degrees or thereabouts is claimed as the most suitable.

This principle put into operation the reverse way is claimed as useful for brake purposes.

The detailed description of the invention involves a hollow self-lubricating axle.

[*Printed, 11d. Drawings.*]

A.D. 1852, December 27.—No. 1169.

GORDON, JOHN FREDERICK.--"Facilitating the turning of four-wheeled carriages, and bringing the front and hind wheels nearer to each other, entitled the 'caster axle.'"

Instead of arranging the front wheels so that they may revolve on the arms of a fixed and solid axle, the inventor places each wheel upon a separate axletree arm which is held or pivotted between two horizontal jaws at the end of the ordinary axletree. The springs are fitted to these arms and are connected by a horizontal bar. Other bars preserve the parallelism of the axles when moved by the draught bar which works round a centre piece. By this arrangement the front wheels can be set further back.

[*Printed, 7d. Drawing.*]

A.D. 1852, December 31.—No. 1211.

LORD, JAMES.—Carriage steps. The inventor projects or hangs a step "from the end of the axle or box of the wheel." This step "rises immediately over the nave of the wheel and

“ may be prolonged upwards over the tire, or it may branch  
 “ out laterally.” There may also be a step below the  
 axle. These steps do not interfere with the revolution of the  
 wheels.

In the case of the “ common grease wheels ” the shank or  
 support to the step is secured to the nut, or rather “ the nut  
 “ and the step should be made in one piece, with an aperture  
 “ for the lynch pin as now.” By another arrangement a  
 hoop secured to the nut may be made sufficiently large to sur-  
 round the hoop of the nave and to the former the step may be  
 attached.

When axles on Collinge’s or other similar principle are used,  
 the arrangement is different. The axle must project through  
 an aperture in the cup and the step attached to it as above  
 “ or be made in one piece with the last screw or nut on it, or  
 “ so as to screw on to or over this last nut or screw or portion  
 “ of it ; or the shank of the step may be made to go through  
 “ the first or second nut and the axle. When the end of the  
 “ arm is made of sufficient length to allow it, the hoop, step,  
 “ and nut in one piece may also be applied.”

[*Printed, 6d. Drawing.*]

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## 1853.

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A.D. 1853, January 4.—No. 15.

FONTAINE-MOREAU, PETER ARMAND le Comte de. — (*A communication.*) — (*Provisional protection only.*) — “ Improve-  
 “ ments in axle boxes.”

The following is this provisional specification : — “ The  
 “ invention consists in suspending the barrel or fusee of the  
 “ axletree of vehicles on a system of small rollers set within  
 “ the axle box, to avoid the rubbing of the axletree against  
 “ the nave, and the oscillations of the carriage.”

The drawing shows an axle box containing two sets of  
 friction rollers.

[*Printed, 5d. Drawing.*]

A.D. 1853, January 7.—No. 46.

SCOTT, WILLIAM CHARLES.—(*Provisional protection only.*)—Wheels.—These improvements in wheels “consist in constructing the same with a wooden stock or nave, metal spokes, and wooden felloes, united and combined together by suitable fastenings.” The provisional specification is not more explicit.

[*Printed, 3d. No Drawings.*]

A.D. 1853, January 8.—No. 53.

LOVELY, ROBERT.—(*Provisional protection only.*)—“Certain improvements in the application of steam to the propulsion of carriages on common roads, parts of which improvement are applicable to the construction of carriages for common roads.”

This invention relates, in the first place, to the locomotive for drawing carriages on common roads. This locomotive is propelled by means of a central wheel placed between the trailing wheels and carried in a frame which is hinged to the body of the engine at the other end. This frame carries the engine, steam being supplied through a stuffed joint. A small vertical cylinder is also fitted to the locomotive for the purpose of lifting the frame and thereby raising the wheel from the ground, or for pressing the latter more firmly downwards. A condenser is also provided.

The carriage shown in the drawing as attached to the locomotive is in two compartments entered at the middle between the wheels. The axletrees are made of boiler plate rivetted or bolted together so as to allow a permanent space between the plates. Iron arms are attached to it to form axles and these are lubricated by holes drilled through them. Transverse springs are also partly contained in it. There is also described a brake the arm of which is made in the form of a blade spring.

[*Printed, 8d. Drawing.*]

A.D. 1853, January 12.—No. 76.

HORROCKS, JOHN.—(*Provisional protection only.*)—Indicating and registering the number of passengers conveyed in public carriages. The inventor states as follows:—“I affix to the

“ door or other convenient part of a public carriage say an  
“ omnibus, an instrument or apparatus enclosed in a box ;  
“ the front of the box inside carries a plate of glass. The  
“ back of the box, open to the view of the conductor, carries  
“ an index or pointer and dial. Inside the box, and travelling  
“ over rollers, is a web on which are figures up to the full  
“ number of passengers the omnibus is intended to carry. A  
“ handle, accessible to the conductor or other person or  
“ persons instructed by the proprietors, is affixed to a spindle,  
“ which traverses the back of the box, and causes the figured  
“ web to move immediately behind the plate of glass in the  
“ front, and at the same time the index is open to view of the  
“ conductor or other person appointed to work the same.  
“ Each time a passenger gets in the conductor turns the  
“ handle, which causes a bell to strike, and alters the figure  
“ behind the plate to correspond with the number of pas-  
“ sengers in the carriage; the same figure is also thereby  
“ indicated at the back of the box. In addition to the number  
“ of passengers travelling at anyone time being indicated, I  
“ obtain the gross number carried by means of an index con-  
“ nected to the shaft of the handle, which is only moved  
“ when the handle is turned forward, but when any passenger  
“ leaves, and the handle is turned back, no action in this  
“ inner index takes place. If the indicator is worked so as  
“ to shew the number of passengers travelling at any one  
“ time the gross amount carried must, according to my  
“ method, be correct. When there is a diversity of fares,  
“ and it is necessary to ascertain the number of passengers  
“ in each, I employ as many registers, registering not only  
“ the number taken into the carriage, but the number getting  
“ out, and I change the action from one to another by means  
“ of a second handle, having a pointer and index of the  
“ number of fares also affixed to the back of case containing  
“ the moving figured web and the registers. This handle by  
“ the same movement, turns a roller within and at one side  
“ of the case, to correspond with a similar roller on the other  
“ side, also within the case, moved by some other person  
“ appointed to do so. These rollers have painted on their  
“ surface as many colours as there are fares to be charged.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, January 12.—No. 82.

**ARROWSMITH, JOHN.** — Shaping axles. This invention consists in rolling or shaping taper axletrees or other articles by means of two plane or curved surfaces moving in opposite directions, the metal to be shaped being rolled between these two surfaces. If necessary they are furnished with grooves or are otherwise fashioned so as to give the required shape.

[*Printed, 9d. Drawings.*]

A.D. 1853, January 15.—No. 103.

**KINCAID, JAMES STEWART.** — Registering number of passengers conveyed in public carriages. For this purpose the carriage is fitted with a turnstile made in two parts, one part being placed on each side of the gangway. By this arrangement a less space is occupied. The two vertical shafts or axes of these parts are connected by an endless chain and they are regulated in their action by a spring connected with each. This spring “has also the effect of making the turnstiles move “ through a fixed space, for instance, through a quarter revolution when the boss is rectangular, the arms being “ pushed through one half quarter revolution or more, and “ the spring moving them the remainder. In this manner “ the two arms or two turnstiles are made to act as one.” The counter is fitted to one of the axes. When a passenger enters or ascends he gives the turnstile a quarter revolution and the same takes place in his exit or descent. The two operations taken together make one whole mark in the index, each quarter revolution of the turnstiles in either direction indicating half a mark on the dial.

A modification of this apparatus is further described, under which, the inside passengers are counted on leaving the vehicle and the outside passengers as they ascend by means of a ladder or steps with a guide rail, between which and one of the upright pivots or shafts the passengers must pass.

[*Printed, 10d. Drawings.*]

A.D. 1853, February 1.—No. 269.

**EDWARDS, ELIEZER.**—Bedstead which may be used as a vehicle. This invention consists in fitting an iron bedstead with a wheel or pair of wheels at one end and a pair of handles

at the other. When the legs of the bedstead at the wheel end are folded up the bedstead may be moved about after the manner of a wheelbarrow and may "be used by emigrants" and others as a vehicle by day and a bedstead by night." The ends of the two side rails may form the handles, and a portion at the wheel end may be made to turn up at right angles when the bedstead is used as a vehicle. It may also be fitted with arched rods to carry a tilt or canopy.

[*Printed, 5d. Drawing.*]

A.D. 1853, February 3.—No. 291.

BOWER, MANOAH.—Scraper for wheels. The object of this invention is to prevent the throwing up of mud by carriage wheels. A scraper made of gutta percha or other suitable material moulded to fit the wheel rim and held by an iron frame is attached to the carriage body or axletree by a curved bar. The scraper is placed about eighteen inches above the ground and removes the mud picked up by the wheel as it revolves. A brush may be used instead of the gutta percha scrapers.

[*Printed, 8d. Drawings.*]

A.D. 1853, February 15.—No. 392.

CHINNOCK, FREDERICK. — (*A communication.*)—(*Provisional protection only.*) — Securing axles in their boxes. For this purpose a semicircular groove is cut round the axle near its end. A similar groove or channel is formed by the axlebox and the cap, and this channel is partly lined by a steel or case-hardened collar, the cap being constructed of similar material, forming the other part. A number of steel balls are inserted into the space formed by these two semicircular grooves, a gap being provided for the purpose and these balls hold the axle and the box securely together. Part of the axlebox is made hollow to contain the lubricating oil which passes to the axle and the balls by means of holes.

[*Printed, 5d. Drawing.*]

A.D. 1853, February 21.—No. 439.

O'LEARY, JOHN.—(*Provisional protection only.*)—Registering number of passengers conveyed in omnibuses. The inventor thus describes his improvements:—"My invention consists

“ principally in the application to such vehicles of a “ turn-  
 “ stile ” or revolving gate, in such a manner that no passenger  
 “ can enter in or upon or leave the same without passing  
 “ through the said turnstile ” and consequently turning the  
 same one-fourth “ of a revolution. The ‘ turnstile ’ is placed  
 “ upon an enclosed platform at the back of the vehicle, and  
 “ the steps for mounting the roof of the omnibuses ascend  
 “ from the said platform within the ‘ turnstile.’ There is no  
 “ seat on the front of the vehicle except for the driver, which  
 “ is railed off in such a manner as to prevent any passengers  
 “ from ascending or descending to or from the roof of the  
 “ omnibus in that direction. The ‘ turnstile ’ is to be con-  
 “ nected to an indicating apparatus by means of toothed  
 “ wheels, so as to indicate accurately upon a dial the number  
 “ of revolutions performed thereby, and consequently the  
 “ number of passengers both entering in or upon and leaving  
 “ the vehicle. It must also be furnished with a ratchet wheel  
 “ and pall, or other similar contrivance to prevent it from  
 “ turning save in one direction.”

*[Printed, 3d. No Drawings.]*

A.D. 1853, February 22.—No. 451.

GOUGY, PIERRE FREDERICK, and COMBE, DAVID.—Skidding wheels. According to one arrangement the skid is attached to the end of a bar hinged under the vehicle and which, when not in use, is drawn up out of the way by a cord. When required for use the skid is lowered and immediately passes into position under the wheel and is held by the drag chain. The system is also applied to a hook-drag. In the case of a two-wheeled carriage, the drag chain may be attached to a lever connected by a joint with the axle above the centre, or it may be passed over a pulley in the end of the lever and attached to the back part of the vehicle. By this arrangement “ a great portion of the weight of the front of the vehicle  
 “ is counterbalanced and the draught thereby rendered  
 “ lighter.”

The patentees also construct the skid with a separate sole plate held to the body by a curved lip and bolts. When worn out this plate can be removed and the skid fitted with a new one.

*[Printed, 8d. Drawings.]*



A.D. 1853, February 25.—No. 478.

DE LA FONS, JOHN PALMER. — Applying skids or drags. The skid, which acts only by its point which is wedge shaped, is attached to a bar moving on the wheel axle. A drag chain is attached to it as usual, and in order to keep this chain out of the way when not in use it is taken up by a spring. The skid lever is raised or depressed by a hand lever from the box. The shape of the skid renders backing to free it from the wheel unnecessary. A modification is also described whereby the skid is raised and lowered by a chain.

[*Printed, 6d. Drawing.*]

A.D. 1853, March 1.—No. 509.

DANIELL, JOSEPH CLISILD. — (*Provisional protection only.*)—Propelling carriages. This provisional specification explains the invention to relate to the propulsion of vessels by means of a column of air or water forced out from the open end of a cylinder within which works a packed piston, the rod of which passes through a stuffing box at the other end.

It states also that the “apparatus may be applied for propelling carriages on roads, when to such carriages engines for driving the same can be applied,” but no further details are given.

[*Printed, 5d. Drawing.*]

A.D. 1853, March 7.—No. 568.

SIMON, GODFREY, and HUMPHREYS, THOMAS.—“Improvements in carriages.”

Part of this invention relates to a method of fitting a moveable seat to the front of single seated phaetons or other open carriages. This seat is fitted over the fore carriage by means of a pair of spring bolts shooting through staples into sockets. The back or rail of the seat is made in two parts with hinges so that if desired half the seat may be used as a driving seat with a back rail, and the other half as a seat for a passenger sitting *vis-a-vis* with the occupant of the carriage other than the driver. Or both halves may be used as such seat.

The end of the perch of the carriage has an eye which fits on a staple on the front axle, and the body is borne on cross springs by means of cross pieces of wood, connected by straps

of iron which extend along the underside of the carriage to which they are screwed. The dasher board may be attached by staples and thumb screws.

The hood is raised and lowered by a hand lever from the inside. Leather cloth is used instead of leather.

The use of hickory for construction of carriages is named in part of the invention.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1853, March 7.—No. 574.

DODDS, THOMAS WEATHERBURN.—Wheels and axles. This invention relates “to the construction of wheels and axles, “suitable for general railway purposes, as well as for ordinary “road work, in such a manner that very superior strength “may be secured in such details. In making the improved “wheels, the malleable iron, or the raw material of the tyres, “is primarily rolled out into long strips or bars, and these “bars are then coiled up into a helix, or volute, and the folds “or contact surfaces are rolled or hammered together at a “welding heat, for the thorough incorporation of the metallic “layers; so that in this way the thickness or transverse “section of the tyre is welded into a homogeneous mass “throughout, instead of having merely a single weld ‘at one “point of the circle. And in building or combining the “details of the improved wheels, the tyres are rolled with “longitudinal side flanges on the inner surface, for the recep- “tion and holding up of the outer ends of the spokes or “wheel arms. The nave or boss of the wheel is of a conical “shape, and the inner ends of the spokes or arms are corre- “spondingly bevilled, so that when the latter are laid round “the nave the cone is drawn up laterally by means of a plate “on the wheel face, fitted with adjusting bolts, and the cone “action then forces out all the arms or wheel spokes in a “radial direction, bringing their outer ends to bear hard “up against the interior surface of the tyre, and binding the “whole wheel into a solid mass. The spokes may either be “of iron or wood or other material, and they may be ar- “ranged to produce a wheel either solid, or nearly so, or “open spoked. When wood is adopted for the spokes, the “pieces are first suspended over boiling tar, or bitumen, so “as to be subjected” to the effect of the “ascending vapour,

“ which acts as an excellent preservative against decay from  
 “ chemical causes; or instead of this system of treatment,  
 “ the wood may be boiled in a composition of red lead and  
 “ bitumen. In fagotting up the improved axles, the separate  
 “ pieces, out of which the required solid axle is to be pro-  
 “ duced, are individually rolled or shaped with a species of  
 “ duplex or other incline of a like character; so that when  
 “ the pieces are laid together they dovetail, or combine  
 “ with each other, in such manner that, when rolled or laid  
 “ under the hammer, the rolling or hammer action forcibly  
 “ combines all the contiguous or contact surfaces together,”  
 and effects “ a good metallic binding down to the centre of  
 “ the incorporated mass. This is the system of construction  
 “ to be followed in the manufacture of solid axles; but  
 “ hollow axles are made in the same manner modified only  
 “ as regards the leaving a tubular centre in the mass.”

[*Printed, 10d. Drawings.*]

A.D. 1853, March 9.—No. 594.

BLACKWELL, SAMUEL.—Strap or band. This strap or band is made by enclosing between india-rubber strips a piece of plaited hemp in the form of a tube. This piece of hemp is, when enclosed, distended to its maximum lateral width, so that after it has been firmly cemented to the india-rubber, it is capable of longitudinal extension. The limit of this longitudinal extension is the limit of elasticity of the strap; so that the hemp acts as a controlling power over the more elastic india-rubber. The band may be strengthened at the ends by linen strips and may be attached to buckles by rivetted plates of metal.

It is intended to be used, among other applications, for check braces for carriages and as luggage straps for fastening trunks on carriages.

[*Printed, 9d. Drawings.*]

A.D. 1853, March 14.—No. 635.

O'LEARY, JOHN.—(*Provisional protection only.*)—Combined chest, bed, and wheelbarrow. The chest is so contrived that by removing the lid and one end and adding handles, legs, and a wheel, it is converted into a wheelbarrow. A piece is cut out of the other end and part of the bottom to allow for

the wheel and the piece so cut out is reversible, so that when placed inside the box, it acts as a guard for the wheel. The apparatus may be used as a bed by placing the lid and end on the handles to prolong the bottom. A covering or tilt may also be added.

[*Printed, 3d. No Drawings.*]

A.D. 1853, March 15.—No. 644.

L'HERNAULT, PIERRE SIGISBERT, and RICHARD, JEAN.—(*Provisional protection only.*)—Disengaging horses. The horses are attached to a hinged splinter bar, the traces passing over hooks. This bar is held in position by a spring bolt, which when released by pulling a cord, allows the bar to fall forward and so liberates the traces from the hook. The liberation of the bolt at the same time frees another bar having skids at the ends, and these, falling under the fore wheels, stop the carriage. The pole chains are attached to eyes carried by a shoe. This shoe is secured to the pole by a spring in such a way that immediately any forward strain is put upon it, as by the horses drawing upon the pole, it gives and liberates the shoe. When the driver wishes to draw the releasing cord he hangs the reins on a hook before him. This hook is held by a spring which gives as soon as any strain is put upon it.

[*Printed, 6d. Drawing.*]

A.D. 1853, April 2.—No. 790.

SNELLING, ALBION RICHARD.—(*Provisional protection only.*)—Emigrants cart. This is a cart so arranged that when not required for purposes of transport, a second and inner body draws out telescopically on friction rollers upon the shafts, which are supported by props, and so forms a compartment which may be used as a habitation. This compartment may be divided by hinged partitions and be fitted with moveable table, seats, shelves, closet windows, &c. A door and steps are fitted at the back.

[*Printed, 7d. Drawings.*]

A.D. 1853, April 7.—No. 841.

GREEN, LEOPOLD JOSEPH.—Axlebox. This invention consists in "using a ring or hollow screw which screws into the inner

“ end of an axletree box ; and by a fixed collar or projection  
“ on the axletree the screw ring retains the axletree in its  
“ box. The screw ring is fixed or locked by means of a bolt  
“ or catch on a bent spring, which partly embraces the axle-  
“ tree box. The bolt passes through a hole in the box, and  
“ enters a recess in the screw ring. The outer end of the  
“ box is covered by a screw cap, which is hollow, and part of  
“ the hollow is covered by a plate by which oil can be placed  
“ in the cap before it is applied to the box, and the box is cast  
“ with a hollow longitudinal projection, with an opening into  
“ the interior of the box by which oil may be supplied.”

[*Printed, 6d. Drawing.*]

A.D. 1853, April 12.—No. 883.

SMITH, JOHN.—Suspending carriage bodies. It is intended by these improvements to relieve the springs of the duty of communicating the draught to the carriage body, for which purpose they are now made heavier than need otherwise be. Accordingly the inventor attaches the carriage body to the axletrees by means of hinged bars and at the same time ensures easy motion by suspending the body upon spiral springs contained in boxes, which have an allowance for play in the shape of a knife-edge bearing or strap sling or shackles. Consequently the springs have only to bear the weight of the carriage body, the traction being affected through the hinged bars.

Various adaptations of the principle are shown, differing, according to the construction of the carriage, in the mode of disposing of the spring barrels.

[*Printed, 11d. Drawings.*]

A.D. 1853, April 18.—No. 930.

BEGBIE, JAMES.—(*Provisional protection only.*)—Improvements in carriages.

Firstly, the body of a two-wheeled carriage is supported on bars which work in longitudinal slots in the framing. By means of a worm wheel and crank, put in motion by a worm worked by hand, the body may be shifted backwards or forwards to adjust the load. An index finger and scale serve

to show the position of the body with regard to the wheels, and the scale may be graduated according to number of persons.

Secondly, in such carriages an additional spring may be placed transversely on the axle, so that when an extra weight is carried it may come into operation, but with the ordinary weight remain inoperative.

Thirdly, forming the spokes of the wheel of an uniform section throughout. The section preferred is in the form of a lozenge.

Fourthly, "the spokes are fitted into a cast-iron nave without shoulders, retaining their entire sectional size to as near the axle as possible."

[*Printed, 3d. No Drawings.*]

A.D. 1853, April 21.—No. 967.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Bending, shafts, felloes, &c. of wood. The machine described by this specification is intended to bend wood for various purposes among which are those named above.

The bending is performed by means of a lever having a curved mould attached to it near its fulcrum. The lever is secured through this fulcrum to its bench. When opened out from the bench, the piece of wood to be bent is inserted between the bench and the moulded end. The end of the wood to be bent is then fixed to a tightening or upsetting screw, also part of the lever and on each side of the wood is placed a flat chain or a curved link in order to guide it. At the back of the wood there is added an adjustable support, worked by a screw, so as to back up the wood at the point of flexure. The wood being so secured, the lever is gradually brought down to the bench and during the process the wood is bent and dragged round the mould the upsetting screw being gradually eased off to prevent destruction of the fibre of the wood on the inside of the curve. The lever is held down sufficiently long by a catch.

The timber for felloes may be bent several pieces at a time, placed side by side, each piece supporting the other.

[*Printed, 7d. Drawing.*]

A.D. 1853, April 23.—No. 979,

WILSON, FREDERICK JOHN.—“An improved wheelbarrow.”

“The wheel is sunk into the bottom of the barrow, the axle supporting the sides underneath, about 14 inches from the end of the barrow. The part of the wheel that is sunk into the bottom of the barrow is covered with an iron cap, which is attached to the floor and about one inch above the wheel. The diameter of the wheel is about 18 inches. The handles are a separate joint from the body, and are placed at an increased angle, so as to decrease the lift. The cap over the wheel, inside the barrow, may have wooden sides to it, a scraper is attached underneath to keep the dirt from clogging the cap. A brass nob is placed in front board, at the top, in the middle, to serve as a guide if required. These specified dimensions are not intended to be unalterable as they may be altered to suit should the wheel be placed more forward or backward to increase or decrease the balance weight on the hand.”

[*Printed, 6d. Drawing.*]

A.D. 1853, April 25.—No. 990.

CHATTERTON, JOHN.—Covers for waggons, carts, &c. The inventor thus describes his improvements :—

“My invention consists in making semi-cylindrical or other shaped covers, which are employed for covering wagons, carts, and other vehicles, in two or more parts, by dividing the said covers transversely, and making the said parts of slightly different sizes, so that they may slide one within the other, after the manner of the parts of a telescope. The object of my invention is to facilitate the loading and unloading of the wagons, &c., to which it is applied ; as my said invention enables the workmen loading or unloading the same to uncover part of the bodies of the said wagons, &c., and in loading to let the goods descend directly into the wagons, &c. so as to occupy the place (or thereabouts) which they are intended to occupy during transit, instead of introducing them at one end of the wagon, &c., and removing them to the other end thereof, as is now commonly practised, and in unloading to lift them directly therefrom. The bottom edges of the sliding parts of the cover may be furnished

“ with rollers rolling on rails, or in grooves on the sides of  
“ the wagon, &c., to facilitate the moving of the said covers.  
“ But I do not limit myself to any particular details, the  
“ essence of my invention consisting in making the said  
“ covers in parts and causing the said parts to slide within one  
“ another.”

[*Printed, 6d. Drawing.*]

A.D. 1853, April 25.—No. 993.

EMERY, JAMES.—“ Improvements in the construction of gigs,  
“ dog-carts, and other vehicles.”

These improvements consist “ in the substitution of cane  
“ work or combined cane and wicker work, for wood, in the  
“ bodies of gigs, and other kinds of vehicles, in the following  
“ manner:—In such vehicles the bottoms or floorings are of  
“ wood, as usual, the sides and back are formed by the inser-  
“ tion of cane uprights, into holes near the edge of the  
“ flooring, at the thickness of a cane or about a quarter  
“ of an inch apart. At certain distances and at each corner, an  
“ iron rod is substituted for a cane, and this rod being driven  
“ through the flooring, is screwed fast underneath; the canes  
“ and rods are then interlaced with canes or willows, and the  
“ whole details are thus bound fast together. A wooden  
“ framing is fixed on the top of the canes, and screwed on to  
“ the iron rods, and the whole thus forms a compact and  
“ unyielding surface. The back of the seat and the splash  
“ board, are made in a similar manner, and very neat and  
“ ornamental devices may be made in the wicker work, whilst  
“ in dog carts air holes may be readily left in the sides and  
“ back.”

“ All kinds of carriages or vehicles may be constructed  
“ upon this principle, but particularly gigs, dog carts, or  
“ other vehicles where lightness combined with strength is  
“ very essential.”

The patentee says, “ I further propose to bind the shafts of  
“ vehicles in general with cane, in order to strengthen &  
“ defend them, & prevent them from splitting. In construct-  
“ ing carts and other heavy vehicles I prefer to use an inside  
“ lining of boarding, so that they may be used for any  
“ purpose.”

[*Printed, 6d. Drawing.*]



A.D. 1853, April 28.—No. 1030.

BIRD, EDWARD.—“Improvements in the construction of certain kinds of vehicles.”

The patentee thus describes the leading features of his improvements:—“My invention consists of a vehicle to be used in place of the ordinary car or cab, and constructed as follows:—The said vehicle may be made to run on two or four wheels, but I prefer two, the seat for the driver is fixed at the back of the vehicle, and on the right hand side thereof, and the door of the said vehicle is situated at the back thereof, and on the left hand side of the driver’s seat, so that the driver can open and close the door of the said vehicle without descending from his seat. The seats in the said vehicle are on the side thereof as in the ordinary omnibus, but I do not limit myself to this mode of construction; the essence of my invention consisting in placing the door and seat of the driver near each other, and at the back of the vehicle; so that the driver can open and close the door of the said vehicle without moving from his seat. My invention applies also to mail carts and vehicles used for the delivery of parcels and goods.

“This vehicle doors or openings are situated at the back or on top of the vehicle, or both at the back and on the top, and the driver’s seat is placed behind the body of the vehicle, so as to give him the command of the said doors. The interior of the vehicle may be divided into compartments or otherwise to suit the convenience of the trade or business for which it may be used. The top of the vehicle separates from the body and on removing the said top the said vehicle may be used as an open cart or vehicle. When used as a mail cart, the larger bags or parcels may be placed in the inside through the door at the back, and the smaller bags hung upon hooks fixed on the inside of the top of the said cart, and the said smaller bags may be introduced into the said cart and hung on the said hooks, by means of the doors or openings on the top of the said cart.”

[*Printed, 6d. Drawing.*]

A.D. 1853, May 2.—No. 1,063.

READING, DANIEL.—(*Provisional protection only.*)—Bearings for axles, and axle boxes and bushes. “This invention con-

“sists in constructing the bearings and bushes for axles generally by forming the bush, box, hub, or stock with a cylindrical, or nearly cylindrical, cavity therein, each end thereof having a suitable orifice exactly opposite and corresponding to that at the other end and through which the axle passes; around which orifice interiorly is an upright rim or flange. And within this are fitted rollers, which are formed with short pivots, one at each end, which not being stepped into any particular point, but allowed to run free within what may be termed the annular grooves between the upright rims or flanges aforesaid and the side of the bush, box, hub, or stock, will thus be prevented from working or falling out of their places, even when the whole is nearly worn out.

“To avoid any friction from the abrasion of any stop, shoulder piece, bolster, or pin used outside the bush, box, hub, or stock for securing the axle in its place, small spherical rollers are to be inserted in an annular groove of such transverse form that it shall allow the said spherical rollers to protrude and run freely, but not to get out of the said groove, the stop, shoulder piece, bolster, or pin working against the surface of the said rollers.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, May 2.—No. 1,068.

NEWTON, MARK.—(*A communication.*)—(*Provisional protection only.*)—Suspending carriages, preventing accidents, wheels, &c. The first part of this invention relates to different modes of suspending or supporting the boxes of vehicles. For two wheeled vehicles two straight springs are “crossed on the surface of the axle tree near the wheels by each of their strongest extremities, so that the box may rest on the most flexible ends of the springs; and in order to support the box in front and behind” a curved spring is fastened to the axle and is secured to the front of the box and under the servant’s seat behind. The steps are fitted to the box itself and various modes of attaching the horses may be adopted. Other modes are described of suspending boxes from springs and in one a sheet of elastic steel is used to prevent oscillation. In the case of four wheeled carriages the arrangements are similar, but in three wheeled vehicles a semi-circular seat is

placed in the bottom of the carriage, and is so arranged that the weight is borne on the back axle, "and establishes a kind of equilibrium with all objects placed in front of this axle." A third wheel is placed in the middle of the width of the box and is of nearly the same size as the other wheels. Omnibuses may be so constructed. "The hind wheels may be fastened by their axle to two nipping springs or in the usual manner."

The improvement in wheels consist in substituting for spokes "a large number of small circles of tempered steel each of which is to be fastened to the nave at one end and to the felloe at the other, the latter being (in order to strengthen the wheel) compressed between two large iron circles of the diameter of the wheel."

For preventing accidents through runaway horses, the pole chains are attached to a pyramidal shaped block of iron which fits a corresponding socket at the head of the pole, wherein it is retained by a very thin and weak strap. The traces have iron eyes which are held to the splinter bar by pins kept in their places by springs. When these pins are withdrawn by means of a lever worked by the coachman's foot, the horses are released from the splinter bar and breaking the strap they are similarly released from the pole.

[Printed, 3d. No Drawings.]

A.D. 1853, May 6.—No. 1,112.

BELL, CHARLES WILLIAM. — (*Provisional protection only.*) — Carriage springs. The inventor uses "rigid levers bearing upon elastic fulcra, or rigid levers combined with elastic springs, in such a manner that by their conjoint action they shall yield to and control the motions communicated from the bed and axles to the body of the carriage in a similar manner to the motion of the parallel ruler." He says, "I propose to use the levers of any convenient form or shape, each of which shall have two points of bearing, one connected by a hinge or joint with the body of the carriage, the other by a joint with the under carriage, or direct with the axle acting much in the same manner as the connecting bars of the parallel ruler, so as to confine the motion of the body to a gliding horizontal as well as a vertical motion, in place of the perpendicular jerk that results from a spring acting vertically. These levers may be single or double in the

“ position usually occupied by the carriage springs, or they  
 “ may be reduplicated one above another in the manner of the  
 “ double parallel ruler; as for example one between the body  
 “ and lock or fore carriage, and one between the lock or fore  
 “ carriage and axle, acting in opposite directions. These levers  
 “ act upon elastic fulcra or springs more or less fixed to them;  
 “ the points upon which these fulcra are made to bear on the  
 “ lever will vary according to the strength of the spring  
 “ employed, and the load to be supported. The springs may be  
 “ of various forms and materials, but I prefer those which are  
 “ the stiffest and quickest in their reaction, and least subject  
 “ to large compression, as vulcanized india-rubber, the stiff  
 “ spiral spring used in railway buffers or the oval steel spring,  
 “ although by a modification of their application even the  
 “ lightest springs may be rendered applicable. Where one  
 “ lever acting on one spring is used as a substitute for one  
 “ ordinary, simple, or compound vertical spring the spring  
 “ employed must rest at one of its two points of bearing on  
 “ some point of the lever, and the other point of bearing must  
 “ abut against either the body or under the carriage or both.  
 “ But these points of bearing of the spring will vary according  
 “ to the proportionate strength or resistance of the spring of  
 “ the load.”

“ I would, however, observe that this invention would be  
 “ incomplete without the means of controlling the upward as  
 “ well as the downward motion of the load, which I accom-  
 “ plish by a counteracting spring upon the lever. I also  
 “ adjust the bearing of the springs on a greater or less length  
 “ of leverage, so as to adapt their combined action to sustain a  
 “ load much lighter, or much heavier than the carriage is  
 “ ordinarily used to carry.”

*[Printed, 3d. No Drawings.]*

A.D. 1853, May 10.—No. 1144.

MURRAY, THOMAS.—Brakes. The brake in this case is fixed  
 to the framing of the cart or other vehicle. The axles of the  
 wheels are fitted in boxes which are capable of permitting to  
 and fro motion of the axles to a given extent. To put the  
 brake on the axles of the wheels are slid forward in their  
 boxes, so that the wheels are brought up to the brakes, and in

this position the axles are held by means of catches worked by a hand lever.

[*Printed, 9d. Drawings.*]

A.D. 1853, May 10.—No. 1146.

SMITH, OCTAVIUS HENRY, and PARFREY, YOUNGS.—Wheels.

The invention consists in “casting parts of the nave of carriage wheels of metal in such manner that each nave has sockets or openings to receive the spokes and the centre of the cast part is hollow to receive wood or soft material. The box for the axle-tree is fixed in the soft material and the ends of the spokes rest upon the soft material so introduced into the nave.”

Wood is considered the best soft material but other substances, such as gutta-percha combined with sawdust may be used.

[*Printed, 6d. Drawing.*]

A.D. 1853, May 14.—No. 1189.

EADES, RICHARD.—(*Provisional protection only.*) — Metallic wheel. This wheel is especially intended for wheelbarrows but is capable of other applications. The spokes are of iron welded to an iron tire. They are curved outwardly from the plane of the wheel, and at their junction are turned cylindrically and from an axle on each side. For purposes of strength a tie may be inserted between the two axles.

[*Printed, 5d. Drawing.*]

A.D. 1853, May 26.—No. 1294.

WARCUP, WILLIAM.—Springs. This invention relates to the arrangement and construction of “railway carriage, buffer, draw, & other springs,” by “the combination of V or double open angular spring blades, the whole being contained in a box or outer shell cover. As applied for the bearing spring of a railway carriage a deep but narrow metal box serves to contain the springs and forms the axle box for the journals. The box is retained in its position by guard irons, bolted in the usual way to the sides of the truck or carriage. The springs are composed of series of plates bent into the V form, and are coupled together by joint

“ pieces, and a pin and roller inserted into the bend of the plates to form a more regular action.”

Various modifications of the invention are described. In some cases a “ single ” **V** spring is employed alone, while in others a number are combined, different modes of effecting the combination being set forth. The springs are for the most part formed of one piece of metal bent into the form of the letter **V**, but in some cases they are formed of two pieces, riveted together. The invention includes an arrangement in which a spring box is fitted with “ side springs ” of **V** form “ which bear against the inner sides of the guard irons, & “ act as buffers to each distinct carriage wheel,” the box being provided with bearing springs composed of any suitable combination of similar springs. Such spring boxes may be filled up between the springs with oil or other lubricating material, which may serve also for lubricating the axles.

[*Printed, 7d. Drawing.*]

A.D. 1853, May 26.—No. 1296.

SAUNDERS, JONATHAN.—(*Provisional protection only.*)—Wheel tires. This invention relates to a process of refining iron for the manufacture of the above articles. For this purpose a composition is used consisting of twenty parts of muriate of soda and one part of a mixture of muriatic and sulphuric acids in the proportion of nine to one. The proportions of the composition are variable according to the quality of the iron. The mixture is added by degrees when the charge of about 4 cwt. is fluid. The mixture and working are not claimed, but only the application of the process to the manufacture of tires.

[*Printed, 3d. No Drawings.*]

A.D. 1853, May 26.—No. 1301.

NURSE, JOHN.—(*Provisional protection only.*)—Fastening and unfastening doors. “ This invention consists in the arrangement of certain mechanism combined with a suitable lock, “ that is a lock to which a system of levers or cords and “ pulleys may be applied so as to draw or shoot the bolt of a “ lock from a distance from the place of the lock, so that “ when applied to carriages (particularly those of the brougham “ class) the coachman outside may open the door without

“ alighting from his seat. It is desirable to place the lock  
“ not as usual, in the door, but in the door post next the lock.  
“ The machinery may, however be arranged so that the lock  
“ may be in the door as usual, the mechanism will then press  
“ back the bolt in order to open the door, and the door will  
“ be locked by pulling to the door, which may be effected by  
“ ordinary mechanism of cord and pulley, the end of the cord  
“ being actuated by the coachman or other person. The door  
“ may also be locked or unlocked from within side the car-  
“ riage in the usual way.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, May 30.—No. 1325.

BROWN, JOSEPH.—Cushions and seats for carriages. “ The  
“ nature of the said invention consists in this, that instead of  
“ the spiral springs now in use for the above purposes, I pur-  
“ pose substituting india rubber straps, or webbing made of  
“ elastic material, to be fixed horizontally or otherwise to the  
“ article required to be stuffed; the method of fixing the  
“ straps may be by sewing or nailing them, or by loops or  
“ buckles and straps. The stuffing to be attached to the web-  
“ bing; and when I make cushions or mattresses for carriages  
“ or for use on board a ship or otherwise, I intend to suspend  
“ them with the elastic webbing or straps to counteract the  
“ oscillation.”

[*Printed, 11d. Drawings.*]

A.D. 1853, June 3.—No. 1370.

MAUDE, WILLIAM EDWARD.—(*A communication.*)—Springs,  
axles, step or under framing. The first part of this inven-  
tion relates to a combination of scroll and elliptic springs.  
The latter are fixed to the axletrees in the usual way and their  
ends are attached by shackles to the ends of scroll springs  
placed transversely to the carriage.

The under framing, which constitutes another part of the  
invention, is constructed upon the principle of causing the  
hind axle to adapt itself to the angular movements of the fore  
axle. This is effected by fitting the hind axle with a turning  
wheel and king bolt and connecting the two axles by bars.

An improved step is also described. The step is attached to a

system of levers by which it is raised or lowered into and from its box or case which is fitted under the carriage. The shutting and opening of the door, aided by a spring performs the duty. The movement of the step resembles that of one line of a parallel rule.

The improved axlebox is constructed with an annular oil chamber in its thickness communicating by holes with the interior of the box. An elastic collar prevents the escape of oil round the axle tire arm and a shoulder on the latter relieves the elastic collar of sudden compressive strains. A screw cap and divided washer holds the box on the axle.

[*Printed, 9d. Drawings.*]

A.D. 1853, June 4.—No. 1372.

LENZ, CARL FEDOR.—(*Partly a communication.*)—(*Provisional protection only.*)—Anti-friction axles. This invention, which is claimed to be applicable to many purposes, consists in taking up the friction of axles by the interposition of bevel wheels, without teeth, revolving against bevelled shoulders near the axles, the bevelled wheels having on the planes of their wider extremities a number of spheres which revolve between the wheels and fixed plane abutments.

[*Printed, 5d. Drawing.*]

A.D. 1853, June 7.—No. 1394.

LEVERSON, GEORGE BAZETT COLVIN.—(*A communication.*)—Springs. This arrangement “consists in combining two “india-rubber or gutta percha cylindrical compressing “springs, or springs composed of such like substances, with “an elliptical steel or metal or wooden spring or jointed rod, “by straightening which the rubber or other springs are “compressed and thus brought into action. A curved bar “spring has on either end a flanch of circular form which is “screwed on with a double nut, by which it can be set out “and in. The two ends of this spring enter short tubes “having a flanch affixed thereto, beyond which there is a “joint by which it is jointed to a clip or wooden or metallic “projection from a spring bar or axle. Between the flanches “are placed cylindrical rubber or gutta percha springs sur- “rounding the tubes, and the discs being kept in place by the “tube and ends of the spring, by this arrangement it will be



“ seen that any force brought upon the curved spring will  
“ cause the rubber, gutta percha, or like springs to be com-  
“ pressed, while the motion round the joint prevents all  
“ tearing of and about the projection.” As a modification of  
this arrangement, “ instead of the steel, metal or wooden  
“ spring, a jointed bar may be employed with similar effect,  
“ especially in cars, waggon, and carriages, for railroads.”

[*Printed, 8d. Drawings.*]

A.D. 1853, June 15.—No. 1454.

PAYNE, JOHN JEREMIAH.—(*Provisional protection only.*)—  
Axles.—This invention consists in mounting each wheel on a  
short and separate axle. Each wheel is placed between a pair  
of springs of the usual pattern and the axle revolves in bear-  
ings attached to such springs. The inner spring of each pair  
is connected with the other by means of a bar of wood or  
metal, which forms a bed to which are attached the other  
necessary bearings to hold the axles. Each wheel and axle is  
therefore free to turn independently.

[*Printed, 5d. Drawing.*]

A.D. 1853, June 16.—No. 1469.

ROOSEVELT, CLINTON.—Anti-friction axles.—The patentee  
surrounds the axle by a number of rollers, which are, in their  
turn surrounded by other rollers, the whole being contained  
in a box. Flanges are fitted to the axle or to the rollers  
to preserve them in their places, and washers of greased  
leather may also be used.

[*Printed, 5d. Drawing.*]

A.D. 1853, June 16.—No. 1473.

SOLOMON, SOLOMON, and MILLS, SAMUEL.—Anti-friction  
axles. The axle is surrounded by a number of metal friction  
rollers. These are held in grooves fashioned on the inside of  
the axle box and they revolve round the centre of the axle as  
well as round their own centres, so that wear is equalised.  
They may have gudgeons, and in this case the gudgeons run  
in smaller grooves cut in the sides of the principal grooves or  
cavities. The hollow part of the axle box, between the grooves

for the rollers, serves as a receptacle for the lubricating material.

[*Printed, 9d. Drawings.*]

A.D. 1853, July 5.—No. 1599.

DAVIS, MARCUS.—Wheels and carriages. This invention relates to numerous improvements in the construction of carriages. Axles are made of tubes, strengthened when necessary by the insertion at intervals of washers strung on a rod. At each end of the axle is secured a sphere on which the wheel revolves. The wheel is made in two parts so that when put together it has a spherical box and a grooved periphery. The spherical box fits the spherical end of the axle, and the groove contains an india-rubber tire, or a tire of hard and soft india-rubber combined, or a tire of asphalt. Various methods of securing these elastic tires are described. Small truck wheels may be made with hemispherical cavities at the sides to receive the axles. The former kind of wheel has also a flat outside bearing surface to keep it vertical; and it has also a concentric oil cavity, with a straining or filtering chamber. Another kind of wheel is made up of a spherical box nave, tubular spokes, and an angle iron rim.

Carriages are constructed of tubing bent into serpentine and other forms, and angle iron frames are used for windows. A ball and socket joint is used for the under carriage.

A carriage for use on scaffoldings and for traction up and down ladders is also described.

[*Printed, 10d. Drawings.*]

A.D. 1853, July 6.—No. 1612.

GASKELL, PETER.—(*Provisional protection only.*)—Springs. The inventor thus describes his improvements:—"For a spring  
" to support any given weight, say a carriage body, shafting  
" working in pedestals or bearings, or any substance requiring  
" elasticity, I propose to take a solid bearing of wood, metal,  
" or any convenient material, and cut it across in or about the  
" centre; then bore a hole in one of the said parts, and fix to  
" the other part a plug to fit into the said hole; then fill the  
" hole partly with india-rubber or similar elastic substance, so  
" that the plug or pin being put into the hole, and the body

“ to be supported requiring elasticity being fixed on the top  
 “ of the said bearing, will spring by the elastic force of the  
 “ substance in the hole aforesaid; or I propose to make a  
 “ slide in the form of a wedge, passing between two outer  
 “ plates, with an india-rubber or elastic band encircling the  
 “ said wedge and plates, or in other words, encircling the three  
 “ plates, the two plates being connected at the top part, which  
 “ may be fixed in any convenient manner, and the body  
 “ requiring elasticity, as, for instance, a carriage-body being  
 “ fixed to the wedge or plate passing between the two con-  
 “ nected plates aforesaid, the elastic band binding the three  
 “ plates together will give ” and “ yield to the pressure or  
 “ weight it has to support, and thus form a perfect though  
 “ novel spring; this spring will work exactly the same as the  
 “ slide valve of an engine.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, July 20.—No. 1720.

DE ST. CHARLES, PHILIPPE POIRIER.—(*Provisional protection only.*)—“ Stopping and starting vehicles.”

The following is the inventor's description of his improvements:—They consist “ in applying a brake to the wheels,  
 “ which takes up the power or momentum of the vehicle in  
 “ motion, and offers an opposition to its further progress, such  
 “ power being again given out and exerted in starting the  
 “ vehicle. By this means the stopping and starting of car-  
 “ riages will be effected more quickly, and less waste of power  
 “ will ensue, and if drawn by horses they will not be subject  
 “ to so much strain as is usually the case. I effect this object  
 “ by placing pinions on the naves of the wheels, which when  
 “ it is desired to stop, are thrown into gear with racks, acting  
 “ simultaneous in the compression of a number of strong  
 “ springs, and oppose a force to the further rotation of the  
 “ wheels. These springs possess great tendency and force to  
 “ recoil when brought to the closest state of compression, and  
 “ are held so compressed during the stoppage of the carriage.  
 “ When the carriage has stopped, the gearing of the racks  
 “ and pinions are changed so that the power of the springs  
 “ are exerted to produce a tendency to turn the wheels in a  
 “ direction to propel the carriage forward. By this means the  
 “ force used to stop the vehicle is beneficially exerted in start-

“ing it again; other arrangements of apparatus may be  
 “employed for the purpose and weights substituted for  
 “springs, with a similar effect.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, July 20.—No. 1722.

MILLS, JAMES.—(*Provisional protection only.*)—Propelling carriages. “The object of the present invention is to dispense  
 “with the use of horses for drawing carriages on common  
 “roads, and to employ in place thereof an arrangement of  
 “mechanism whereby the running wheels may be actuated  
 “by manual labour. To effect this object,” the inventor says, “I propose to construct the running wheels of a greater  
 “diameter than usual, and to connect them to a fly wheel,  
 “drum or pulley by means of a rod, one end of which is  
 “attached to a crank pin connected with one of the spokes  
 “of the running wheel, and the other end to a similar pin  
 “on the side of the drum, wheel, or pulley which is made to  
 “oscillate or rock backwards and forwards by manual labour,  
 “and thereby impart rotary motion to the running wheels.  
 “Sometimes on ascending hills, or on rough or heavy ground  
 “when an increased amount of tractive power is required,  
 “the running wheels are driven by toothed gearing, bevil  
 “toothed wheels being mounted on the axle of one or both  
 “running wheels, and an intermediate bevil wheel is made to  
 “gear into such toothed wheels. Upon communicating  
 “motion to the intermediate wheel by means of a winch  
 “handle attached thereto, the other wheels, and consequently  
 “the running wheels, will be actuated and cause the carriage  
 “to move forward.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, July 22.—No. 1733.

SPENCER, GEORGE.—Springs. The springs, described in various applications in this specification, consist of rings of india-rubber, formed of two truncated cones placed base to base, strung on a rod. Each ring is surrounded by a metal hollow ferrule attached to it, so that under compression the rings fill the ferrules and the latter restrain the tendency which such rings possess to swell at their largest diameter.

[*Printed, 8d. Drawings.*]

A.D. 1853, July 26.—No. 1757.

BANKS, THOMAS, and BANKS, HENRY.—Brake. This invention, which is claimed as applicable to common road carriages, is thus described:—

“ We propose to place on the axletrees of carriages a description of brake, consisting of three discs, the first of which is fixed to the axletree. The second is somewhat larger in diameter than the others, and has on its periphery a number of cams or projections; this will turn slightly on the axletree. The third disc is of the size of the first, and will move in a line parallel with the axletree, but is prevented from turning or revolving on it by a feather. A spiral spring coiled round the axletree keeps the second and third discs tightly pressed up against the first which is secured to the axletree. A rod running parallel to and between the axletrees terminates at one end in a crank handle. About the centre of this rod a double armed cross lever is attached so that on turning the crank the arms of this cross piece hook the projections or cams on the centre discs on the axletrees and as the arms catch the cams, the one under and the other above the disc, the wheels are immediately locked, and yet not so suddenly as to cause damage, for should the weight or the impetus of the train be great, the centre disc, on which are the cams, is as above described, capable of turning slightly on the axletree and thus yielding in some measure to the sudden check. For carriages running on three pairs of wheels an additional rod between the second and third pairs is required, which is placed higher than that between the first and second. A connecting rod working freely upon crank arms above the first rod and under the second imparts a slight revolving motion to the second rod parallel to the axletrees, and by a double joint action lowers a catch piece (which is hung at the opposite end to the framing of the carriage) down on to the cams in the centre disc on the axle, consequently all three pairs of wheels are simultaneously locked, and yet, from the form of the cams, the train may be backed without interruption. By an easy arrangement of rods attached to the crank handles and running the whole length of the

“ carriages, with coupling chains between the brakes in the  
 “ whole train, may be under the control of one man. A  
 “ modification of the apparatus described will apply equally  
 “ well to ordinary road vehicles.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1853, August 2.—No. 1800.

BOTHAMS, JOHN.—(*Provisional protection only.*)—Tires for wheels. The inventor says, “ My improvements in the tyres for  
 “ wheels has for its object to obviate the weld or union of the  
 “ metal across the tyre at any one point, by obviating which  
 “ it is much less liable to break than the ordinary construction of tyre. To effect this object I take a bar of suitable  
 “ dimensions, and wind it in the form of a helix of sufficient  
 “ breadth to form the tyre; it is then heated and welded  
 “ together in a solid mass, and afterwards rolled or hammered  
 “ of the proper size and shape for the purpose required.

“ Instead of winding the iron in the form of a helix, it may  
 “ be wound in the form of an involute, or made of a series  
 “ of hoops, either welded or otherwise and placed together so  
 “ that the joints do not coincide when the whole mass is  
 “ welded together.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, August 11.—No. 1867.

FINNEMORE, JOSEPH BACON, and CHATTAWAY, EDWIN DANIEL.—Passenger indicator. “ This invention consists in  
 “ fixing to the doors of carriages, vehicles, vessels, or buildings an apparatus consisting of an upright standard or  
 “ pillar, with cross arms or levers, which arms rise and fall  
 “ by means of an inclined plane, and are so arranged that  
 “ one arm must necessarily always stand across the doorway,  
 “ whilst the other arms hang parallel to the upright standard.  
 “ On a passenger entering the omnibus, vehicle, or building  
 “ he pushes forward the arm or lever, which forward motion  
 “ brings a second arm across the doorway, and so on ad  
 “ infinitum; and as each arm or lever is thus carried forward  
 “ it registers one on a dial attached to the apparatus.”

[*Printed, 6d. Drawing.*]

A.D. 1853, August 11.—No. 1868.

DEWSNUP, THOMAS.—Motive power for propelling carriages, &c. The motive power for the above and other purposes is obtained by the tension of india-rubber strips which tension is created by winding ropes or other connections, attached to the india-rubber on drums. The drums are held by ratchets which, when freed, allow the india-rubber to contract and so communicate motion to the vehicle.

The power is also claimed to be useful for actuating railway brakes.

[*Printed, 6d. Drawing.*]

A.D. 1853, September 12.—No. 2112.

CANNON, CHARLES.—Propelling carriages. A pair of fly wheels are mounted on a shaft. Each is constructed with one half its periphery thicker and heavier than the other half and is so keyed on the shaft that as the thickest and heaviest part of one wheel is descending, the corresponding part of the other is rising. The shaft is rotated by treadles or levers and cranks or excentrics communicate the motion to the wheels.

[*Printed, 6d. Drawing.*]

A.D. 1853, September 17.—No. 2162.

LILLY, THOMAS EDWARD.—(*Provisional protection only.*)—Two wheeled carriages. The inventor says, “My invention relates to such carriages or vehicles as have but one pair of wheels, and are connected with the axle by means of springs, such as hansom cabs. My said invention consists in connecting the step by which the driver mounts to his seat with the axle of the said carriage, instead of with the body or springs thereof, and also in connecting the iron or frame on which luggage is placed underneath the vehicle with the said axle, instead of with the body of the carriage, as is usually done. By thus connecting the said step and luggage iron with the axle, instead of with the body or spring of the carriage, the balance of the said carriage is not disturbed by the said luggage, and the shaking of the said carriage and disturbance of its balance produced in ordinary cabs when the driver mounts his seat is avoided.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, September 17.—No. 2168.

DE BODE, Baron HENRY.—Wheels. The felloes of these wheels are made of wood saturated with some fatty matter, and while still hot, placed on a table having a fixed curved mould and a sliding counter worked by screws and so bent. When put together the joints are curved by pieces of iron bent round their sides. The nave is made in two pieces, in one of which the spokes are fitted in recesses or stalls, the other being put on as a cap. If the periphery should expand and so cause the spokes to become loosened, the cap may be removed and wedges inserted under the spokes, after which it is to be replaced.

[*Printed, 6d. Drawing.*]

A.D. 1853, October 4.—No. 2270.

NORTON, JAMES LEE.—Distance indicator. The apparatus described by this specification is intended to fulfil the following functions: to indicate, firstly, the whole distance traversed by the vehicle; secondly, the total paying distance; thirdly, the distance travelled by each passenger marked on paper which can be filed as ordinary bills; and lastly, the distance traversed by each passenger for the particular passenger's inspection.

The movement of the wheels is communicated to the counting apparatus by means of a column of air or water in a flexible tube acting on a flexible diaphragm. The passenger indicator is put into action by the carriage seat similarly through the medium of the column of air or water. In order to prevent the machine registering, as a new passenger, one who simply gets out to make a call, the driver has control of a handle by which he throws the seat out of gear until a new passenger is taken.

The registrations on paper are effected by a pointed index which pricks the paper as the seat is worked.

[*Printed, 1s. Drawings.*]

A.D. 1853, October 8.—No. 2306.

DUBS, HENRY.—Wheel tires. The inventor makes tires for railway and other wheels by welding together a number of rings superimposed, but so that no joint of any ring is above



a joint of any other ring. Instead of a number of rings, helical strips of iron may be so welded. He makes use for this purpose of a furnace having a fire-clay hood, by means of which the flame is deflected downwards and radially on to the tire.

[*Printed, 7d. Drawing.*]

A.D. 1853, October 11.—No. 2325.

FARJON-DEMOULIN LOUIS ALEXANDRE.—(*Provisional protection only*).—Brake for carriages. This brake consists of a toothed wheel placed on the nave of the carriage wheel, and fitted with two palls, one for forward and the other for back motion. These palls are raised from the wheel by means of lifts or cams worked by two levers or handles with which they are connected by rods or cords, either passing through the length of the vehicle or attached to balance beams. The pall on one side of the wheel when in gear prevents motion backward, and the other motion forward. The application of this brake to carriages with and without springs is described.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1853, October 14.—No. 2369.

PALMER, WILLIAM.—Ventilators. This specification describes many forms of ventilators applicable to various purposes, amongst which are the following for use in carriages :—

To the upper part of the window sash is secured a ventilator made of perforated metal or glass or wire gauze. The ventilator consequently rises and falls with the sash, and ascends when not required, and the sash is fully shut into a box or recess contrived in the upper part of the window frame.

A combination of perforated plates and a central perforated corrugated plate, the latter being useful for preventing draughts.

A ventilator for the tops of carriages, consisting of two cylinders of perforated material placed one within the other, and separated by a space. The cylinders have a close top, and are attached to the vehicle by a socket joint.

A ventilator for similar purposes, consisting of a perforated or partly perforated cylinder fitted with weather guards or cups, and having inside another but smaller cylinder, also

shielded, and fitted with an ordinary revolving plate ventilator, by which the supply of air may be regulated.

[*Printed, 8d. Drawing.*]

A.D. 1853, October 17.—No. 2395.

DE LA FONS, JOHN PALMER.—Distance indicator. “ This  
“ invention has for its object improvements in apparatus for  
“ measuring and indicating the distance travelled by a cab or  
“ other carriage, and is so arranged that being set at zero by  
“ the driver when a passenger enters the carriage, a moving  
“ scale with or without a bell indicates the completion of every  
“ half mile, and thus points out the fare which is payable.  
“ The apparatus is also so arranged that the whole distance  
“ run shall be indicated, and also how much of such distance  
“ has been with passengers. For this purpose there is an  
“ excentric fixed on the nave of one of the wheels, which gives  
“ motion to a connecting rod which is in two parts, the one  
“ sliding within the other. The upper end of such connecting  
“ rod moves on a pin joint, hence the play of the springs is  
“ compensated for. The connecting rod, by a suitable driver,  
“ acts on a ratchet wheel, and moves it a distance each revolution  
“ of the excentric on the wheel of the carriage, and the  
“ axle of the ratchet wheel gives motion by a pinion to a  
“ cog wheel on another axle, on which axle is a ratchet  
“ which gives motion to a scale, and moves it a distance each  
“ half mile; such scale commencing at zero has the fares engraved  
“ on it payable for each mile or part of a mile gone.  
“ The scale has a ratchet on it by which and a spring stop or  
“ catch it is retained from moving back, except when acted  
“ on by the driver by moving away the spring catch, when  
“ the scale moves to zero, and so long as the spring stop is  
“ held back no indication takes place in regard to the scale,  
“ but the distance run is indicated by another scale which is  
“ in constant gear with the apparatus put in motion by the  
“ excentric; and there is a third scale, which comes into and  
“ goes out of action with the first scale; hence the third scale  
“ indicates at all times the distance run during the time of  
“ there being a passenger, and as it is not set back to zero when  
“ the first scale is, the third scale goes on adding each mile to  
“ what has been previously run. Hence the passenger, by  
“ simply seeing that the first scale is set at zero on getting

“ into a carriage, has indicated, on completing the distance,  
“ the sum to be paid, and the owner of the carriage at the  
“ end of the day by the outer two scales can ascertain what  
“ the whole distance gone has been, and how much with  
“ passengers.”

[*Printed, 11d. Drawings.*]

A.D. 1853, November 1.—No. 2524.

NEWTON, MARK.—(*A communication.*)—Improvements in carriages. The first part of this invention relates to the construction of two-wheeled vehicles. The axle-tree is slightly bent, and is fitted with “sills” or plates for the bedding of the shafts and springs. The shafts may also be made in one piece with the axle-tree, being of iron welded thereto by a species of neck. The body is supported on the ends of crossed springs, and another spring is placed at right angles to the centre of the axle-tree, and attached from the ends by bars or links to the front and back of the body. The latter is also shown supported on a flexible plate. The shafts are made of wood and iron in combination. Modifications of the system of suspension are shown.

Another part relates to three-wheeled carriages. Here the greater part of the weight is borne by the hind wheels over which the body is supported on the ends of springs. In front is the single wheel not dished at all, and carried by a vertical “poll bolt” passing into a spring socket held by the framing which here runs in to a point. The coachman’s seat is above this part. This fore wheel is chiefly used to guide the vehicle, the weight being adjusted on the other two. The draught is attached to the “poll bolt” of the front wheel, and the springs secured to the axle of such wheel. Omnibuses may be so constructed.

The bodies of four-wheeled carriages may be supported on systems of springs such as those applied in the above-mentioned cases.

Further improvements have relation to means of attaching horses to the vehicle, so that in case they should take fright they can be easily released. The traces have eyes which are held to the splinter bar by pins steadied in their sockets by springs. The pressure of these latter is capable of being relieved by the coachman from the box, whereupon the pins

release the traces. The pole chains are held by a loose cap on the end of the pole. It is maintained on the pole by a weak strap, so that directly the horses released from the splinter bar exert a forward strain upon it, the strap breaks and liberates the cap. Under the carriage are fitted spring bars which may be projected outwardly to engage the wheels and arrest their rotation.

The axle-box is fitted inside an ordinary nave, and is closed entirely at one end. It has a broad collar on it at the other end, which fits the inner end of the latter. The axle-tree has also a collar round it, and on the inner side of this collar is placed a pair of washers each in two halves. Between these two washers there is a space for the reception of leather packing, and between the outer side of the washer nearest the collar on the axle-tree and the face of the axle box is also a space sufficient to allow the whole to rotate round the axle-tree collar. The washers are bolted to the collar on the axle box, and so form part of it, and enclose the fixed collar on the axle tree. Means are adopted for lubrication.

The patentee also constructs wheels as follows. Round the nave he disposes a number of small hoops. These are confined in a larger hoop concentric with the nave, and between this hoop and the periphery are placed another series of rings, or the inner system may be suspended in the wheel by tension bars or ropes. Again, the spokes as ordinarily used may be dispensed with, tension bars or ropes attached to a hoop round the nave, and to the periphery of the wheel being substituted.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1853, November 2.—No. 2538.

WARD, EDWARD.—(*A communication.*)—Axles. “The invention consists in putting on and fixing to that part of a carriage axle on which the axle box works a sleeve or case of any suitable metal or alloy, which said sleeve or case is attached to the said axle. The axle box to which the wheel is affixed works upon the said sleeve or case instead of upon the solid axle, as is usual, and when by wear or otherwise the said sleeve or case no longer works with sufficient accuracy in the axle box, the said sleeve or case may be removed

“ from the axle, and its position changed, as herein-after described; or a new one substituted.”

[*Printed, 5d. Drawing.*]

A.D. 1853, November 5.—No. 2578.

KESTERTON, EDWIN.—Springs. The patentee thus describes his invention :—

“ In two-wheeled carriages, instead of the shafts being continued to the back of the carriage, according to the method generally followed with the shafts of two-wheeled carriages, I only carry them back to about one-half or two-thirds more or less of the length of the body of the carriage, and join a spring thereto, which I carry to or beyond the end of the body. To this spring I bolt or otherwise attach the hind scroll iron. Instead of fastening the fore scroll iron rigidly to the shaft and body iron, I allow the shafts a little play up and down between the top and bottom of the collar attached to or forming part of the body iron. The top of the scroll iron is fastened by a bolt or pin to the under part of the collar. By this improvement applied to two-wheeled carriages the motion of the horse is compensated or absorbed by the joint spring attached to the back end of the shaft, consequently a comparatively rigid shaft may be employed with as much if not greater ease to the body of the carriage than if a lancewood shaft were used. In the case of four-wheeled carriages I apply my invention to elliptical springs, to that part of the spring which forms the upper half of the ellipse by inserting a joint at or about the centre.”

[*Printed, 6d. Drawing.*]

A.D. 1853, November 9.—No. 2600.

DICKS, WILLIAM.—(*Provisional protection only.*)—Wheels.

“ This invention relates to an improved construction of wheels for carriages, principally intended for carriages for common roads, and consists in forming the spokes of such wheels of metal, being made hollow and elliptic, the spokes being set so as to present their narrow or cutting edges, and thus offer less resistance to the atmosphere than when placed as at present. The tires may also be formed of iron and made double, so that when the outer tire is

“ worn it may be easily replaced. The spokes may be cast into the nave.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, November 15.—No. 2642.

CATTERSON, JOHN JOSIAS.—Springs. This invention relates to a method of combining “single” and “double” springs. By a “single” spring is meant a spring attached at one end only, a “double” spring being held by the centre, and having two elastic ends. A number of combinations are shown, such, for instance, as one double spring having its ends secured by links to the ends of two single springs, and so forth.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1853, November 17.—No. 2667.

UNDERWOOD, WILLIAM.—(*Provisional protection only.*) — Wheelbarrow cooking stove for emigrants. The inventor says, “ My invention consists in arranging within an iron case an open or close grate for the burning of coals, wood, or other combustibles, with the flues so constructed as to convey the heat first to an oven placed above the fire, and next to a boiler for water placed at the back of the oven, beyond which, at the extreme back, is the chimney, so constructed that it may be lengthened, but in such a manner that the lengthening piece, by means of a “hinge” joint, may be elevated or laid down on the top (desirable when out of use, and more convenient for packing). Another feature of my improvement is to provide a stand for such cooking stove, such stand being made with a wheel and handles, after the fashion of a wheelbarrow, enabling the emigrant to remove his stove from place to place, as he may require, and the barrow will be of great service to him in providing fuel for the stove and for other purposes.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, November 17.—No. 2668.

BURTON, CHARLES.—Hand and draught carriages. This invention consists “in the first place in adapting and applying to such hand carriages, as portable chairs or couches for invalids or others, and trucks for carrying goods, a certain

“ kind of leverage by which the carriage may be propelled  
“ and guided from behind in such a manner as to give  
“ increased power of action to the hand. The leverage  
“ referred to consists of a long bent arm on each side of the  
“ carriage, connected to the frame thereof, and united at the  
“ upper part by a rod or handle extended across from one to  
“ the other. These bent arms or levers extend a considerable  
“ distance beyond the hinder axle of the carriage, and thereby  
“ form a leverage by which the front part of the carriage may  
“ be raised or turned on the hinder wheels and axle as a ful-  
“ crum. The front axle is fixed in the frame of the carriage  
“ so as to be incapable of being turned obliquely thereto,  
“ except, when acted upon by means of the bent arms or  
“ levers and there is a single guiding wheel on this axle.”

It also consists “ in the second place in constructing hand  
“ carriages for children in such a manner as to admit of  
“ their being packed with more facility. For this purpose  
“ the back of the carriage is made to fold down upon the seat,  
“ and the sides above the seat likewise to fold down in both  
“ cases by means of hinges. The two bent arms or levers are  
“ also jointed, so that portions of them may be detached.  
“ And these arms or levers are connected to the frame of the  
“ carriage by a hinged or a pin joint, so that on the removal  
“ of a fixing screw on each side the frame of the carriage may  
“ be folded close under the body. The wheels on the hinder  
“ axle are also easily removable.”

The invention further “ consists in the third place, in con-  
“ structing light draft carriages with bent arms at the sides,  
“ fixed at their lower ends to the frame work in front, such  
“ bent arms serving to support the body of the carriage instead  
“ of the ordinary springs.”

The specification shows also a “ sedan chair ” on wheels,  
the body being made of any convenient form, but preferably  
“ with glazed frames or shutters formed with hinges and  
“ with a tongue at each side fitting a groove in the front  
“ part of the carriage body, such frames or shutters being  
“ made to rest in any required part of the grooves by means  
“ of a spring or a screw.”

Various modifications are shown in the construction of the  
various carriages included within the specification. For  
instance two wheels may be placed on the front axle, instead

of one; and in the case of trucks scroll irons may be attached to the framing so that they rest on the ground when an unusually heavy weight is put on the truck.

[*Printed, 7d. Drawing.*]

A.D. 1853, November 18.—No. 2673.

PARSONS, PERCEVAL MOSES.—(*Provisional protection only.*)—Brakes and springs. The first part of these improvements relates to the application of retarding powers to wheels. For this purpose under one system, it is proposed to utilize the rotation of the wheels themselves as the power to work the brakes; and under another system, the movement of the wheels is retarded by bringing in contact with them other wheels revolving in an opposite direction.

The invention further relates to a method of restricting the action of springs in order that they may not interfere with the action of the brakes, as is often the case where the handle plays up and down with the carriage while the brake itself is required to be kept in contact with the wheel. For this purpose some of the plates of the spring are made to “strain or brace and reduce the compass of the spring to any required degree, by their tensile action on one or more of the others or on each other, in such a manner as to allow it free action to yield or bend to any weight or strain it may be subjected to greater than that to which it is thus braced or strained.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, November 21.—No.—2701.

PARFITT, AARON.—(*Provisional protection only.*)—Adjusting weights in carriages. The inventor says “My improvements, which have reference to dog-carts and other similar two-wheeled vehicles, consist in a mode of rendering such vehicles self-adjusting, by so constructing them that the opening of the back panelling or foot board, to prepare the vehicle for the reception of four persons, may through the intervention of certain mechanism, work the body of the said vehicle forwards, and the shutting of the same, when two persons are to ride, may similarly work the said body backward, so that in all cases the centre of gravity of



“ the loaded vehicle may be brought vertically, or nearly so,  
“ over the axle without the employment of a screw apparatus  
“ as in vehicles at present in use. The peculiar claim is, to  
“ the construction of a dog-cart or similar vehicle, in which  
“ the centre of gravity will be adjusted to two or more  
“ passengers, by the same exertion which opens or closes the  
“ footboard or back panelling, whereas the screw apparatus  
“ now in use requires a subsequent laborious process; the  
“ details of the mechanism admit of various modifications.”

[*Printed, 3d. No Drawings.*]

A.D. 1853, November 23.—No. 2720.

ABRAHAM, HENRY ROBERT.—Hearses.—This hearse may be mounted on two or more wheels. They run on bent axles, so that the body of the hearse is brought down nearly to the ground. The door is at the end and the interior of the vehicle is divided in compartments by moveable partitions so that a number of coffins may be carried, or a part of the interior may be used for the transport of the attendants, as may be desired. The sides have windows fitted with shutters to be used when coffins only are conveyed.

The specification also describes cases designed by the patentee to receive each a coffin for transport. They are boxes mounted on little wheels so that they may be readily moved. When a number of coffins are carried, there is less difficulty in identifying them when each is placed in a special receptacle and locked.

[*Printed, 9d. Drawings.*]

A.D. 1853, November 25.—No. 2741.

DE MONTFERRIER, ALEXANDRE ANDRÉ VICTOR SARRAZIN.—Wheels. The wheel itself consists of a disc perforated with four circular openings and having a tire. An opening is also made in the centre for the axle. This axle has four pairs of parallel arms, each pair having the plate between them. They carry at their extremities little friction rollers each of which runs in one of the circular holes in the plate of the wheel. Consequently, the vehicle is carried by these little friction rollers so running in the plate as it rotates, the axle to

which the arms are attached being quite free in the central aperture of the wheel plate.

[*Printed, 8d. Drawings.*]

A.D. 1853, December 3.—No. 2815.

BUCK, CHARLES. — Brake. “On each side of the cart or carriage, and immediately in front of the wheels (the hind wheels if there are four) are placed two self-acting breaks forced against the periphery of the wheels by a spring, but connected with the shafts or fore carriage of the vehicle in such a manner that when the horses draw upon the shafts or fore carriage the breaks are withdrawn from off the wheels. Whenever the vehicle has a tendency to run forward upon the horses, as in descending hills, the spring forces the breaks into contact with the wheels, and retards or stops their progress; the force of contact being still further increased by the resistance of the horses against the shafts or fore carriage. If the vehicle is to be backed, the action of the breaks is stopped by inserting a bolt.”

[*Printed, 6d. Drawing.*]

A.D. 1853, December 13.—No. 2892.

SCHIELE, CHRISTIAN.—“Improvements in preventing undue oscillation in engines, machinery, carriages, and other apparatus.”

The object of this invention may be effected in various ways, but the patentee prefers to employ for “governors” a species of friction collar or bush, acting on the spindle of the governor, such collar or bush having, moreover, a free play within the ordinary collar or other bearing, so that the action of the governor when working regularly shall be free and uncontrolled, whilst on a sudden change taking place, whether it be an increase or a decrease in speed, the up or downward traverse of the bearing causes the friction collar to press against the spindle, thereby restraining the tendency to a further rise or fall, as the case may be. In place of a frictional surface other arrangements may be employed, according to the nature of the oscillations to be controlled, but in most cases “a frictional appliance may be found to answer.” In

some cases a piston in a cylinder is employed, “where a liquid  
“ or air is the medium acted upon by the oscillating force; in  
“ other cases the controlling or retarding force may be ob-  
“ tained from the action of a vane upon the atmosphere or  
“ upon a liquid.”

The “principle or main feature” of this invention is set forth as consisting “in causing the oscillating force to be  
“ absorbed, and thereby retarding or controlling the undue  
“ oscillation of moving bodies in whatever form such oscilla-  
“ tion may present itself.”

A mode of applying the invention to the buffer of a railway carriage is described, in which a brake or frictional piece is pressed against the buffer rod by means of a spring, the amount of pressure being regulated by a screw, the end of which bears against the spring. The brake or frictional piece thus “absorbs a portion of the power acting longitudinally  
“ upon the rod.” A similar arrangement is also described as being applicable to the draw rod of a railway carriage, but the patentee states that the same end “may be attained by several  
“ modification of frictional appliance.”

[*Printed, 6d. Drawing.*]

A.D. 1853, December 17.—No. 2943.

JAMES, ISAAC.—Manure distributing cart. This invention relates to a method of constructing carts for distributing water and liquid manure. The inventor says, “first, as regards  
“ that part of the cart called the distributor (and through  
“ the perforations of which the water or liquid manure  
“ passes), my improvement consists in forming such distri-  
“ butor with a lid, to enable the inside of the distributor to be  
“ readily cleansed. Another improvement in carts consists  
“ in the use and employment of perforated plates of metal, or  
“ double screens or sieves, for the purpose of straining the  
“ liquid manure through and thereby preventing the refuse  
“ of straw &c., of the manure, from entering into the body of  
“ the cart, and choking the holes in the distributor. And  
“ lastly, another improvement in carts consists in a new mode  
“ of connecting together the boards which compose the body of  
“ the cart, the novelty consisting in employing joint boards  
“ match’d, their points of junction being rendered watertight

“ by a piece of hoop iron covered with brown paper and white  
 “ lead inserted in a groove or recess formed along the edge  
 “ of each board.”

[*Printed, 7d. Drawing.*]

A.D. 1853, December 24.—No. 2990.

MARGERISON, JOSHUA.—(*Provisional protection only.*)—“ Im-  
 “ provements in railway breaks.”

This invention consists “ in furnishing the carriages & tender  
 “ of a railway train with a longitudinal sliding bar, to which  
 “ is attached a chain acting upon knee-joint levers which  
 “ bring into action a pair of clamp breaks, such breaks being  
 “ made each to act upon a drum fixed on the axles of each  
 “ carriage. A slight play is allowed between the ends of the  
 “ several bars to admit of the screwing hard up in coupling.  
 “ A rack and pinion or other suitable mechanical arrangement  
 “ in the break van or tender serves to bring the break of that  
 “ particular van into action and by the contact of the end of  
 “ this rack with the end of the sliding bar of the next car-  
 “ riage” which is again connected with the sliding bars of the  
 other carriages “ the whole of the friction drums of the train  
 “ may be acted upon simultaneously. Springs are employed  
 “ to return the levers to their original position when the  
 “ pinion is reversed.” “ Should the clamp break be found  
 “ too powerful, a short lever with clogs and springs behind,  
 “ may be suspended on each side of the drum, and be acted  
 “ upon by the sliding rod.”

“ By another arrangement the clamp levers are worked by  
 “ a third lever, the shorter end of which is connected by a  
 “ chain to the knee-joint of the clamp levers, while the other  
 “ end is connected by a crank to a cross bar which unites the  
 “ two buffer heads. The sliding bars above described may be  
 “ obviously applied to the working of the ordinary breaks on  
 “ the wheels themselves, and in some cases the knee-joint levers  
 “ may be replaced by other mechanical arrangements.”

“ Another form of break applicable to engines consists of a  
 “ stand upon the side or framework of the engine near to the  
 “ centre of the driving wheel. On this stand is fixed the  
 “ fulcrum of a lever, the short end of which would be imme-  
 “ diately over the crown of the driving wheel, and the long  
 “ arm extending to the furthest end of the engine from the

“ situation of the driver. To the fulcrum end is attached a shaft bearing down upon the centre of the driving wheel, and fixed there to a slip break over the crown of that wheel. From the points of this break is attached a connection to work a small lever break on the face of each running wheel. This machinery must be attached to each side of the engine and so balanced as to be out of action when at rest. From one extreme point of the levers to the other across the head of the engine, is passed a bar that unites those points, and upon that bar must be fixed another lever, the long arm of which stretches back to the hand of the engineer or stoker, to be acted upon either by hand pressure a weight screw, or spring, but perhaps the pressure of the hand might be sufficient with a compound lever of such length as might be used.”

“ Certain portions of the arrangement herein-before described are obviously applicable to common road carriages.”

[Printed, 3d. No Drawings.]

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1854.

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A.D. 1854, January 5.—No. 24.

JOHNSON, JOHN HENRY. — (*A communication from John Chilcott and George T. Palmer.*)—“Improvements in ventilating carriages and buildings.”

This invention relates “to the cooling and ventilating of carriages and buildings in general, but more particularly to the ventilating of railway carriages, and consists in the employment of a film of water kept constantly trickling over a web of fibrous, porous, or perforated materials stretched over the windows of the carriage or building to be cooled. By this means the incoming air is perfectly cooled, and the entrance of dust effectually prevented. In place of fibrous material, plates of glass of an angular form may be so arranged as to be constantly kept moist with running water. As applied to railway carriages a tank of water is fitted to the bottom of the carriage, and the water

“ is pumped up to an another reservoir on the top of the  
“ carriage, the pumps being worked by a wind wheel of a  
“ peculiar construction. This wheel contains a series of  
“ buckets or chambers arranged circumferentially, and is  
“ surrounded by a number of moveable wind guides to direct  
“ the wind upon the wheel in the proper direction from  
“ whatever quarter it may be blowing.

“ The same arrangement of apparatus is equally applicable  
“ with slight modifications to the warming of carriages and  
“ buildings by purifying and warming the air previous to its  
“ entering therein.”

[*Printed, 11d. Drawing.*]

A.D. 1854, January 5.—No. 26.

POMME, LÉON JOSEPH.—Anti-friction axles. This invention has for its object “ to avoid the absorption of motive power  
“ caused by the friction of axles and axletrees in the axle  
“ boxes and bearings of railway carriages and other vehicles  
“ used on common roads,” and consists “ in substituting for  
“ the usual axle boxes and bearings a frame formed of two  
“ side plates united at the top and having between them two  
“ cylindrical rollers which rest upon the neck or journal of  
“ the axle. These rollers are of a larger diameter than the  
“ axle, and serve as antifriction rollers.”

“ The frame is moveable and causes the two rollers to be  
“ in constant contact with the axle or axletree of the vehicle.”

An arrangement is described in which two antifriction rollers are used, each of the rollers being held suspended by its trunnions between the two plates of a certain frame,  
“ within which they turn freely without coming in contact,” a clip and spring also aiding the action of the apparatus. The connection of the frame with the clip and spring “ may be  
“ disposed as a joint.”

In order to lubricate the axes of the antifriction rollers, the patentee perforates the head of the trunnions as far as the axes, the latter being thus supplied with the lubricating matter. And in order to prevent the oil from escaping the openings of the trunnions are closed by an air-tight metal stopper or spring.

[*Printed, 6d. Drawing.*]

A.D. 1854, January 16.—No. 98.

NEWALL, JAMES.—“Improvements in machinery or apparatus for stopping or retarding the progress of railway and other carriages and in the mode or method of connecting two or more carriages with the said apparatus together.”

This invention relates to improvements upon the invention No. 939, A.D. 1852, that invention consisting mainly in the application of a lever acting on the break shaft in such a manner “that when it is lifted up it detaches the break blocks from the wheels, and when it is allowed to fall down it forces the block to the periphery of the wheels by its own weight or gravity thus being partially self-acting.” The mode of raising the lever, as there described, combines the use of a spring or springs, enclosed in a cylinder, a vertical rod, a rack and wheel, and certain longitudinal shafts, all of which are fully set forth, but in the present invention the apparatus is worked “from underneath the carriage instead of the top,” this being accomplished by “fixing the longitudinal shafts under the centre of the carriages,” or as nearly so as may be convenient, the cylinders containing the spiral springs being placed near the bottom part of the end of the carriage and the springs, acting upon the break lever from the bottom of the cylinder instead of the top. In applying the apparatus to carriages and waggons “where there is not sufficient height of body or framework to fix the cylinder and frame on the end” the patentee fixes it under the waggon or carriage in a transverse position and combines it with a bell crank lever, and in the case of a single waggon or carriage, with a ratchet wheel and pawl these arrangements keeping the breaks out of action when they are not required to operate. The invention includes arrangements for working the breaks either from the tender or from any carriage in any part of the train, as well as from the guard’s van or box, this being accomplished “by fixing the ratchet wheel on the tender and conveying and uniting the connecting shaft to the longitudinal shafts, either to the top of the carriages or underneath them.” If underneath, the connecting shaft is passed through the centre of the tender; if on the top, it is carried upwards in a diagonal position.

Another part of the invention consists in the adoption of

“ other modes of connecting the revolving shafts ” besides those described in the specification of the patent mentioned above. One of these modes includes the use of short rods or levers, so jointed together as to adapt themselves to the varying distance of one carriage from another but still admitting of simultaneous rotary motion; this arrangement being applicable not only in the working of breaks, but also as a means of connecting one carriage or waggon with another “ instead of the chain usually employed.” In this case four short rods are used, but another arrangement is described in which two only are employed, and a bell is so mounted in connection with this apparatus as to give notice to the engine driver when the breaks are brought into or taken out of action by the guard.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1854, January 17.—No. 107.

CROSSKILL, WILLIAM.—(*Letters Patent void for want of Final Specification.*)—Wheels. This invention consists in making the wrought-iron rim or tire of two different diameters, so that the same wheel may be worked on railways or on common roads without alteration. When the wheel runs on a common road it travels on that part of the tire which is larger in diameter; and this part forms the flange when the wheel travels on a rail upon its lesser diameter.

[*Printed, 3d. No Drawings.*]

A.D. 1854, January 17.—No. 111.

CORLETT, HENRY.—Springs. This invention consists in the “ combination of springs in the form of the letter C with “ springs of the elliptical form (or substitutes therefor), the “ former being so applied and connected as to be brought “ into action in a direction opposite to that of the latter, “ but simultaneously therewith, that is to say, the elliptical “ springs or their substitutes being placed horizontally under “ the body of the carriage, and the C springs being connected “ to them so as to occupy a vertical position; also when used “ as buffer springs, the two kinds of springs are arranged “ respectively so as to present in the same manner an elastic “ resistance to the pressure applied to them. Both the C



“ springs and the elliptical springs may severally be formed  
 “ of a single plate of metal and united at their ends. A pair  
 “ of the former may be placed on each side of the latter, and  
 “ united to each other at their ends by means of cross screw  
 “ rods or bolts and nuts, or when a greater number of C  
 “ springs are used, by rings or clips ; and these may again be  
 “ connected or united to the elliptical springs by means of a  
 “ piece of metal or other material extending from one of such  
 “ screw rods to the other, and by screws (with nuts) passed  
 “ through such a piece of metal and the elliptical springs ; or  
 “ by other suitable mode of connection. Tension rods, plates,  
 “ or stays may in certain cases be substituted for elliptical  
 “ springs. The elliptical springs when as bearing springs  
 “ will be fixed at their centre part to the ordinary blocks  
 “ or bearings above and below for the carriage body and axle  
 “ respectively.”

[*Printed, 7d. Drawing.*]

A.D. 1854, January 28.—No. 210.

GRIST, JOHN.—(*Provisional protection only.*)—Brake. The inventor describes this brake as consisting “ of a small wheel  
 “ or wheels, which may be brought to bear both against the  
 “ running wheel or wheels of the carriage to be retarded or  
 “ stopped, and against the ground rail or other bearing on  
 “ which the carriage is travelling. The small wheel or wheels  
 “ is or are to be mounted on an axis connected with an ar-  
 “ rangement of levers or other apparatus, in such manner  
 “ that the driver or guard may, when necessary, bring the  
 “ break into or out of action.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, February 6.—No. 285.

FIRTH, BENJAMIN WRIGLEY.—(*Provisional protection only.*)—  
 Brakes for “ railway and other carriages.”

The method of working brakes is briefly described in connection with certain apparatus for communicating in trains. A wire or cord passes from end to end of the train and by means of vertical levers attached to this communicating wire or cord and to the brake levers, the latter are actuated.

[*Printed, 6d. Drawing.*]

A.D. 1854, February 10.—No. 320.

BROWN, DAVID, and BROWN, JOHN.—“An improvement  
“or improvements in the construction and manufacture of  
“axles for railway and other carriages.”

According to the first part of this invention a hollow axle is formed by placing together the edges of two semi-cylindrical pieces which have been previously prepared by rolling, and then uniting such edges by welding; in some cases other semi-cylindrical pieces being placed outside these, the joints, however, of the second pieces not being directly above those of the first and the whole being welded together. A cylindrical core may be introduced inside a hollow axle thus formed and united thereto by welding, a solid axle being thus produced, the patentees preferring in this case to form the hollow axle in the first place with longitudinal internal ribs, the core being grooved to correspond therewith. By using short cores axles may thus be made partly hollow and partly solid, being solid at the ends and middle (for example) and hollow in the other parts. A machine is described as being applicable for welding together the different parts of which these axles are composed this machine consisting essentially of two parallel rollers upon which the axle rests while under operation and two upper parallel rollers which are pressed down upon the axle by screws, these latter rollers being mounted in bearings capable of sliding up and down and provided with weighted levers by which the rollers are raised when the pressure of the screws is removed. The number of rollers used may be varied and they may, if desirable, be of such shape as to form necks on the axles.

[*Printed, 9d. Drawings.*]

A.D. 1854, February 10.—No. 322.

DRAY, WILLIAM.—Framing for carts and other vehicles. Framing for this purpose is to be made of metal tubing and “where frames only are required, as for some descriptions  
“of wagons or carts” the vertical tubes are made to “terminate in a T shape at top and bottom” and are then secured to the horizontal tubes by screws.

“Frames for phaeton, gig, and other similar structures,  
“may also be constructed of tubing by bending such tubes

“ in the ordinary manner to the shape of the intended body  
“ or other part of the carriage, and connecting such frames  
“ together by horizontal, vertical, or transverse tubes.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, February 11.—No. 337.

JENNINGS, JOHN, the younger.—Brakes. Part of this invention has reference to the adjustment of the load in a carriage and the method of applying the brakes. In the case of a two wheeled vehicle, for instance, the shafts are supported on the springs which, in their turn, are borne by frame carrying a slide and capable of moving to and fro on the axle. The brake blocks are fitted to the shafts and the action of the horse in backing puts them into operation. By means of the slide above mentioned, the weight of the vehicle is moved to and fro in respect of the position of the horse according to the nature of the ground. The frame is furnished with spiral springs attached to a pin projecting from the axle. These springs control the sliding movement and prevent jars.

[*Printed, 7d. Drawing.*]

A.D. 1854, February 14.—No. 360.

WILSON, GEORGE.—(*Provisional protection only.*)—Axle-boxes. The improvements are thus described by the inventor:—  
“ The object of this invention is to facilitate the removal of  
“ brasses from axle boxes when worn and required to be re-  
“ placed or repaired. To this end, instead of making the  
“ brass bear directly against the top of the box, as is usually  
“ the case, I interpose between the two a filling piece or  
“ wedge suitably shaped to retain the brass in position by  
“ means of a lip or other projection which, bearing against  
“ the brass, will prevent it from moving in the direction of  
“ the length of the axle. The filling piece itself is retained in  
“ position by reason of the removeable cap or cover of the axle  
“ box bearing against its outer end. In order to withdraw the  
“ brass it is only necessary to remove the cover, and lift the  
“ carriage slightly so as to relieve the filling piece from pres-  
“ sure; the filling piece being then drawn out, the brass may  
“ be readily lifted out of the box and replaced by a fresh

“ brass. The filling piece is then placed over the brass and  
“ the cover of the box re-attached.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, February 21.—No. 421.

VON RATHEN, ANTHONY BERNHARD, Baron.—(*Provisional protection only.*)—“ Improvements in omnibuses for the purpose of adapting them to be drawn by one horse, and to be attended by one man only.”

The inventor says: “ my invention consists in fixing to the front of the omnibus a platform, with steps on both sides for passengers to ascend to enter the omnibus from the front. The platforms on both sides of the horse are connected and held together by trellis work or wicker work. The passengers from the platform enter the omnibus by doors which can be opened by the foot of the coachman, by a spring or other suitable means. The coachman takes the fare and no guard or conductor is wanted. By pulling a cord in the omnibus any passenger can give the signal to the coachman to stop; passengers are only to be carried inside the omnibus, and I propose that no heavy luggage should be taken. The seats inside are so arranged that the greatest part of the weight rests upon the hind wheels. The doors may be replaced by a curtain if more convenient, which also will save weight.”

[*Printed, 5d. Drawing.*]

A.D. 1854, February 22.—No. 431.

BOYDELL, JAMES.—“ Improvements in applying apparatus to carriages to facilitate the draft.”

This invention relates to improvements on a previous invention, No. 11,357, A.D. 1846. That invention “ consisted in the application of moveable detached parts of a railway to the wheels of carriages, whereby each part is successively placed by its wheel on to the road or land over which the carriage travelled, each part of the portable railway when down allowing its wheel to roll over it, the wheel depositing and lifting the parts of the railway in succession; and ” the “ present improvements consist in the application of side pieces to each portion of the moveable

“ rails so as to obtain a more extended bearing for the rails  
 “ whilst the wheel is passing over it, and the invention also  
 “ consists in the construction of the parts of the portable rails  
 “ by combining tough iron and wood to obtain great strength  
 “ with lightness.”

[*Printed, 9d. Drawing.*]

A.D. 1854, February 23.—No. 439.

STOY, HUGH.—(*Provisional protection only.*)—Brake. The drawing and description show the application of the improvements to a train on a railway. The driving wheels of the engine do not run on the rails, but are raised and act on fly wheels. A brake band is fitted to them. Their motion is communicated to the other wheels by cranks and connecting rods. A method of operating the brakes on each carriage by means of a through rod put into action by the collapsing movement of the train is also shown.

The inventor then says, “ the break on the carriages of every  
 “ description on the common roads can be acted on a bar  
 “ from the hind axle, by the hand or foot of the driver on the  
 “ box, to lock his wheels at pleasure, and release it again at  
 “ pleasure.”

[*Printed, 5d. Drawing.*]

A.D. 1854, February 24.—No. 448.

BANFIELD, JOHN.—(*Provisional protection only.*)—Communicating with drivers and conductors. The inventor thus describes his improvements:—“ My invention consists in  
 “ applying to carriages or vehicles used for street or common  
 “ road travelling, a means whereby the occupant or occupants  
 “ may communicate with the driver or guard of such carriage or vehicle, and the manner in which I purpose carrying  
 “ my invention into effect will be understood by the following description:—I propose using two tubes, secured  
 “ together for convenience, one about one inch in diameter  
 “ in the bore, and the other about half an inch in the bore.  
 “ Those tubes I propose to make of gutta-percha that material  
 “ being a good conductor of sound, but it may be necessary  
 “ at the part that passes through from the inside to the outside of the vehicle to use tube more flexible or pliable  
 “ than gutta-percha, and in that case I prefer using tube

“ composed of india-rubber, to which the gutta-percha both  
 “ outside and inside must be securely fixed. To the outer  
 “ end of the small tube I attach a whistle, and to the end  
 “ of the larger tube I attach a suitable mounting of a  
 “ trumpet for the guard or driver to apply his ear to receive  
 “ the instructions from the occupant, the inner end being  
 “ fitted with a suitable mounting for the mouth of the  
 “ occupant to speak through, while the smaller tube is  
 “ supplied with a mounting through which the occupant  
 “ blows to sound the whistle.

“ This being the main feature of my invention, I may add  
 “ that it is capable of considerable modification, such as  
 “ applying the apparatus on each side of a carriage, both the  
 “ tubes being connected in the roof to one outlet, and which  
 “ outlet may be more durable and convenient (for the use of  
 “ public vehicles) if made of metal, the whistle being con-  
 “ nected with such tube in any convenient part, so as not to  
 “ interfere with its convenience as a speaking tube; or the  
 “ second or whistle tube may be dispensed with altogether by  
 “ using a portable whistle, such whistle being formed to fit  
 “ the mouthpiece of the speaking tube, and being portable  
 “ may be removed after calling attention and any directions  
 “ given through the same tube; or it may be preferable, in  
 “ lieu of using the whistle, to substitute a string attached to  
 “ an alarm or bell. And in case of such apparatus being  
 “ applied to omnibuses, it may be necessary to have several  
 “ mouth-pieces and whistle stopper or bell pulls, all concen-  
 “ trated to one outlet or bell to the guard or driver, as it may  
 “ be desirable.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, February 28.—No. 491.

HOLBECHE, JOHN SODEN.—“ Improvements in the construc-  
 “ tion of invalid bedsteads, which said improvements are also  
 “ applicable for couches, chairs, and reclining seats or beds  
 “ for invalid carriages.”

These improvements, says the patentee, consist—

“ Firstly, in applying to bedsteads, couches, chairs, and  
 “ carriages for invalids, cords of caoutchouc, or other springs  
 “ which yield and contract longitudinally, such springs being  
 “ so adapted to the weight of the body as to form a counter-

“ poise thereto, the frame of the bed or couch being so jointed  
 “ as to conform itself to the positions the patient may wish  
 “ to assume. This is effected by removing a catch, which  
 “ prevents the springs from acting, and which requires only  
 “ a slight amount of muscular exertion, the patient allowing  
 “ the bed to raise him or her to the position required, and  
 “ when in that position allowing the catch to resume its  
 “ former position, the bed will be fixed. The reverse of this  
 “ may also be effected; that is to say, the bed may be lowered  
 “ by removing the catch, and the patient allowing his or her  
 “ weight to overcome the springs. Or again, if desirable, the  
 “ patient may by the slightest exertion oscillate or rock him-  
 “ self or herself, by holding the cord communicating with  
 “ the catch or detent.

“ Secondly, in so constructing the bottom or foot part of  
 “ bedsteads, that the foot board may be converted into a table  
 “ or reading desk.

“ Thirdly, in so arranging the bottom part of the bed  
 “ frame, that it may be inclined at any angle that may be  
 “ required for the support of the legs; this, united with the  
 “ first part of my invention, above referred to, converts the  
 “ bed into a chair.

“ Fourthly, in removing a portion of the foot posts, or so  
 “ constructing them, that they may be shortened and re-  
 “ lengthened, so that the invalid may lie in a position suitably  
 “ inclined to the horizontal, such arrangement being in con-  
 “ nection with the springs before mentioned.”

Amongst its other applications, the invention is shown  
 applied to a wheel chair or carriage having a corrugated or  
 folding hood connected and working with the apparatus. .

[*Printed, 1s. 4d. Drawings.*]

A.D. 1854, March 7.—No. 543.

JOHNSON, JEREMIAH.—(*Provisional protection only.*)—Brake.  
 To the wheel is attached a ratchet wheel or other suitable  
 stops the rotation of which is arrested by means of pawls or  
 hooks thrown into gear by means of a bar or chain worked by  
 a hand lever.

The drawing shows the application of this brake in a con-  
 tinuous form to trains.

[*Printed, 5d. Drawings.*]

A.D. 1854, March 10.—No. 578.

DAY, WILLIAM.—(*Provisional protection only.*)—Covered vehicle available as dwelling houses. This vehicle is built up of “packing cases,” the lids forming the roof when opened and supported by rafters. The floor is of boards and doors and flap windows are supplied. The shafts slide in when not in use and props may be fitted at the corners.

Two or more such carts may be combined and constitute a four wheeled vehicle and pole draught may be applied.

By removing the cases the cart forms a dray. The packing cases may be used to contain the wheels and other matters; or may serve for the transport of merchandise.

[*Printed, 5d. Drawing.*]

A.D. 1854, March 20.—No. 655.

ESNOUF, EDWARD, MAUGER, CHARLES, junior, and LEWIS GEORGE WASHINGTON.—Portable dwellings and vehicles for emigrants. The following is the description of the patentees’ improvements:—“Our invention consists of improved tents  
“ or dwellings adapted for travellers or emigrants, and which  
“ form (when not in use as a tent) a chest, or the body of a  
“ vehicle. The framing of one of these tents consists of a  
“ series of rectangular or other shaped frames of wood or  
“ metal; a number of these are hinged together in such a  
“ manner as to fold one upon another when closed, similar  
“ to the leaves of a screen. Several of these frames are hinged  
“ or otherwise fastened together, according to the size of the  
“ tent required, one of the end frames being fitted with a  
“ door, which forms the entrance to the tent, and when the  
“ frames are closed together the edges of the frames form the  
“ sides of a box or chest, and the door serves as a lid for the  
“ same. A rectangular piece of wood, the size of the frames,  
“ is placed beneath the lower frame and forms the bottom of  
“ the chest; four or any other number of rods or bolts are  
“ passed through holes made in the frames for the purpose,  
“ and secured to the bottom by nuts, which fasten the whole  
“ firmly together. When the tent is in use the bottom of the  
“ chest forms either a table or bedstead by screwing four legs  
“ into the under side of it. The framing before referred to is  
“ covered with canvas in the ordinary manner, the peak or



“ apex of which is supported by a central pole. If a per-  
 “ manent dwelling or building is required, the framing may  
 “ be covered with wood, metal or other suitable material. In  
 “ some cases the pole may be made of tubes of metal, to slide  
 “ one within another, or a pair of shafts may be joined  
 “ together by a collar or fid, to form the pole. To give the  
 “ framing the necessary rigidity and prevent it folding or  
 “ collapsing, each pair of frames is held together by a metal  
 “ clip, or by radial rods screwed into the tent pole or into a  
 “ collar or flange fitted thereon. The sides of the tent being  
 “ perpendicular, it is much more commodious than those of  
 “ the ordinary conical shape, and as the framing may be bent  
 “ or folded in any direction, the shape of the tent may be  
 “ varied at pleasure. The chest or hose before referred to  
 “ forms the body of a cart or vehicle; an axle is fitted in  
 “ sockets or bearings beneath the chest, and a pair of wheels  
 “ secured upon it in the ordinary manner; a pair of shafts  
 “ secured to the front by bolts and pins, or other suitable  
 “ fastenings, completes the vehicles. The iron legs of the  
 “ table and bedstead are made to screw into each other and  
 “ into the edge of the chest; these form a support for a tilt  
 “ or cover to the cart or vehicle. A couple of planks are  
 “ fitted inside the body of the cart for seats, these are made  
 “ to form convenient seats for the tent by screwing light  
 “ metal legs into them. A vehicle of the foregoing descrip-  
 “ tion is well adapted for the use of sportsmen and tourists,  
 “ as it can be used as a vehicle during the day and a tent by  
 “ night. A highly ornamental appearance may be given to  
 “ the vehicle if desired, or it may be made to resemble those  
 “ used by sportsmen, and known as dog carts, or be adapted  
 “ for pic-nic parties, and many other useful purposes.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1854, March 28.—No. 715.

ROBERTS, JOHN.—Cabriolets. The inventor's improvements  
 are thus stated by him :—“ In the first place instead of having  
 “ the doors in the front part of the vehicle, as in the cabriolets  
 “ extensively used and commonly known in England as  
 “ ‘Hansom cabs,’ I place two doors at the back part thereof,  
 “ and I arrange and dispose the seat thereof (when the vehicle

“ is intended to carry not more than two persons) in such a manner as that the sitters may face the horses in the ordinary way of riding or sitting in vehicles intending to carry two persons. And a peculiar feature of novelty in my invention consists in making the seat moveable upon a pivot or centre or otherwise, thereby enabling the passenger or passengers to leave and enter the vehicle by one or other of the doors, as may be most convenient or desirable, or by that door which is nearest to the curb or footpath of the street, road, or way. Secondly, I form the lower half of the front part of the vehicle with a hollow panel, and I make the upper half of the front part of the same so as to close or open by means of a balanced, suspended, or sash window, or Venetian or Louvre blind, which when lowered fits or slides into the before mentioned lower and closed half or hollow panel, and partakes of the same curvature or form. And in constructing cabriolets for the use of the public, I place a platform between the closed part of the front of the vehicle and the dash board for placing luggage upon, and I arrange the seat for the driver behind and between the two doors, thus enabling him to open or close the doors of the vehicle without dismounting from his seat. I also place the lever or handle for opening the doors and an apparatus for turning the seat round either within control of the driver alone or the passenger, or both, as may be found most convenient or expedient. I also propose to attach a hook to the front panel in order to hang thereon a safety rein by means of which the vehicle may, when desired, be driven from the interior by the passenger.”

[*Printed, 9d. Drawing.*]

A.D. 1854, March 30.—No. 726.

CORRALL, WILLIAM.—(*Provisional protection only.*)—Framing for carriages, &c. This invention consists in constructing the framing of various kinds of vehicles of metal tubing united by screwing or otherwise. The inventor arranges the tubing, where possible, “in such a position as to form a truss or trusses.”

The applicability of this system of tubular construction to other parts of vehicles, such as the “pole shafts and the spokes

“ of the wheels ” is claimed, but the inventor does not claim its application to axles.

[*Printed, 5d. Drawing.*]

A.D. 1854, April 3.—No. 761.

HODGES, RICHARD EDWARD.—Elastic wheels. For the purpose of obtaining elasticity in wheels it is proposed to attach the nave to the periphery by means of straps or slings of india rubber in a state of tension. In some cases there may be concentric rings so joined or attached. Various modifications of the system are shown.

[*Printed, 9d. Drawing.*]

A.D. 1854, April 7.—No. 807.

GLOVER, FREDERICK ROBERT AUGUSTUS.—Two wheeled carriages. The first part of this invention relates to the shafts. They are forked and made of elastic wood or metal. One limb of the fork is attached to the axle, the other to the body of the vehicle and if necessary a stop is inserted in the elastic fork. The floor of the carriage may also be suspended beneath the axle.

The carriage itself is so constructed as to allow the horse to be brought close to the axles. The body rests on a “ transom “ frame ” which extends some distance forward on each side of the horse. The transom rests on one limb of each of the shafts, and is secured by a hinge, the other limbs being attached to the axle. To prevent oscillation of the body, check straps or bars are provided and two other straps, secured to the transom frame, pass round the double shafts and secure an easy motion when the horse is trotting. The seats are arranged for the adjustment of the weights. Instead of rigidly attaching the shafts, they may be loosely connected and draught applied to to the axletree direct.

[*Printed, 10d. Drawing.*]

A.D. 1854, April 8.—No. 834.

GILBEE, HENRY.—(*A communication.*)—Axle boxes. The axle is surrounded by a number of friction rollers, each made in two dimensions the larger diameter of each running on brass sleeves placed on the smaller diameter of the other. The

larger diameters alone come in contact with the axle. An oil chamber is made in the surrounding box, from which the oil passes to the bearing by a small aperture.

[*Printed, 11d. Drawings.*]

A.D. 1854, May 12.—No. 1067.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—(*A communication.*)—Axles and axle boxes. “The first part of this invention relates to the form and construction of the journal, or that portion of the axle which fits the box, and its principal object is to throw the weight towards the centre of the length of the box, and of the tread of the wheel, and the strain directly and equally towards the two ends of the journal, and thereby prevent the axle and box wearing unevenly, and throwing the wheel out of truth. It consists in making the said part in the form of two truncated cones, united at their truncated extremities; one of the said cones being made solid with the axle, and the other being made loose, and sliding over the end of the axle, in order that the box may be easily put on and removed from the axle without being divided longitudinally, as it must necessarily be for a solid axle having a journal of the above form.

“The second part of the invention relates to the method of supplying the axle with oil or other lubricating matter, and consists in surrounding the axle with an annular oil box, containing openings so disposed as to admit all the oil at or near the middle of the length of the journal or the junction of the two cones, from which part it will be distributed equally all over the journal.”

[*Printed, 5d. Drawing.*]

A.D. 1854, May 15.—No. 1085.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Rotary cutting apparatus for shaping wood, &c. “This invention consists in so constructing the cylinder or cylinders to which the cutters are affixed that there shall be an open space or spaces in the cylinders from front to rear, for the purpose of allowing slivers or large shavings or chips to pass through; the lighter ones being thrown off tangentially by the velocity of the cylinder, a guide or directrix on the shaft of the cutting cylinder is provided, and may be formed of

“ the cutter head itself, against which the pattern is held,  
“ whilst the cutters operate on the material to be cut, and  
“ which is laid upon or attached to the patterns by points or  
“ otherwise. The shaft, its collars, the lower cutter head,  
“ and brace or centre piece, may all be cast or wrought in  
“ one piece, and the plates out of which the cutters are formed  
“ placed therein by running down the upper cutter head,  
“ thereby holding them in place, and turning off and finishing  
“ the whole in a lathe. The upper cutter head is removable  
“ for the purpose of removing and replacing the knives  
“ therein. Inclined or excentric grooves, recesses, or dove-  
“ tails are formed in the upper and lower cutter heads, into  
“ which are slipped and set the cutters; and when properly  
“ adjusted to the peripheries of the cutter heads, the nut or  
“ cutter head is run down upon the screw cut upon the shank,  
“ and the whole is firmly and securely held together. The  
“ knives may be straight or curved, and although the inventor  
“ has found two to answer every purpose, more may be used  
“ if deemed essential. The heel of one knife forms the throat  
“ for the next one, and the space between the heel of the first  
“ and the edge of the second knife may be considerable, but  
“ yet form a perfect throat, when the velocity with which  
“ the cylinder is rotated is considered, it being about 3,000  
“ per minute.

“ Suppose a pattern, having one irregular edge, is placed on  
“ the table. To cut a duplicate of this pattern, a suitable  
“ piece of material is placed on top of it, and held there by a  
“ few metallic points fixed on the upper side of the pattern;  
“ the two pieces are fed along by the hand in the direction of  
“ the running of the cutters; this operation draws the  
“ pattern and the rough material up against the cylinder  
“ and cutters, the pattern bears against the head, and the  
“ rough material against the knives of the cylinder. The  
“ cutters work upon the edge of the piece to be cut, whilst  
“ the cutter head receives the pattern, and prevents it and the  
“ piece upon it from coming any nearer to the cutters than a  
“ given distance, which is regulated by the shape of the  
“ pattern; as the knives are gauged and set by the cutter  
“ heads, and the pattern is also controlled by the cutter head,  
“ it is evident that the piece will be cut precisely to the  
“ pattern, that is, within the limit of the operation of the

“ machine, the said limit being to any curve greater than the periphery of the cutter head.

“ The edges of the knives, instead of being straight, may be curved, indented, convex or concave, or inclined, for the purpose of cutting a corresponding surface in reverse on the material operated upon. The shaft of the cutters or the bed may also be inclined for some work. The machine is peculiarly adapted to the cutting of the curved or irregular work of carriages or cars, fellies, &c.”

[*Printed, 9d. Drawing.*]

A.D. 1854, May 18.—No. 1108.

MAGGS, OLIVER.—(*Provisional protection only.*)—“ Applying shafts to agricultural implements and carriages.”

“ The object of this invention is to obtain a ready adjustment of the position of the shafts of agricultural implements and carriages. For this purpose the shafts are attached by pin joints to the implements or carriages, and they have each a curved bar passing through them, perforated with holes; and according as the shafts are to be adjusted for a higher horse or other animal, so will be the position to which the shafts are to be raised; and they are to be retained by pins passing through the shafts and the curved bars, and the set or position of the implements may also be adjusted thereby.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, May 27.—No. 1179.

SCHMOOCK, JULIUS.—“ Improvements in the construction of children’s and other carriages moved by manual power.”

This invention has for its object an improved mode of guiding vehicles propelled by a person from behind. It is thus described by the patentee:—“ I prefer constructing such carriages with four wheels, as being more safe: but I would here remark that my invention is also applicable to carriages with three wheels, and may be adapted either to carriages with or without springs. The fore axle of the carriage is mounted upon a turn plate connected to the “perch” or the fore part of the carriage. At the back part of the carriage I place a transverse handle, mounted upon a pin or

“ stud passing through the centre thereof, such handle being  
 “ capable of vibrating upon the said centre. To this handle,  
 “ upon each side of the centre thereof, I attach a cord, rod,  
 “ chain, or wire, the other end thereof being affixed to the  
 “ opposite side of the fore axle, so that the said cords, rods,  
 “ chains, or wires (which pass around pulleys attached to the  
 “ hinder axle) cross each other under the centre of the car-  
 “ riage. The carriage is propelled and steered by means of  
 “ the handle, as it is evident that by depressing either side of  
 “ the handle a corresponding movement either to the right or  
 “ left will be imparted to the fore axle, and consequently to  
 “ the carriage.”

[*Printed, 6d. Drawing.*]

A.D. 1854, June 3.—No. 1240.

CHAVANES, ANTOINE.—(*A communication.*) — Indicator for carriages. To the carriage is fitted a clock, suitably protected and having two faces. One face shows the time as usual, the other is a slate or similar disc, divided into hours and marked on each side during rotation by a tracer. One tracer is thrown into operation by the passengers weight on the seat, and the other only acts when the carriage is empty. When the passenger depresses the seat it is held down by a catch, which is released by the driver when the passenger leaves the carriage. The movement of the seat as above, throws one tracer out of the gear and the other in. It also puts into operation a disc showing the fare to be paid, which disc returns to zero when the seat is restored by the driver. The movement of the seat also works an indicator showing that the carriage is engaged or the reverse.

[*Printed, 9d. Drawing.*]

A.D. 1854, June 8.—No. 1267.

SKERTCHLY, JOSEPH, junior.—(*Provisional protection only.*) —“Improvements in . . . vehicles, waggons, carts and  
 “ trucks for common roads” &c.

This invention relates to the manufacture of various articles of wood and then when such articles are fully shaped, cover-  
 “ ing them with sheet metal by passing the two through a  
 “ draw bench or other suitable machine. The articles may

be put together in the ordinary manner, but in forming mortice and tenon joints, the tenon is subjected to pressure in dies before insertion so that by expansion it may make a secure joint.

[*Printed, 3d. No Drawings.*]

A.D. 1854, June 28.—No. 1420.

DE FONTAINE MOREAU, PETER ARMAND le Comte.—(*A communication.*)—Axle box. This axle box is of a truncated conical shape enclosed in the nave. The axle runs in it on two bearings leaving between them a space for the oil. The box is closed at one end by a screw cap, at the other by a gland screwed down on to annular washers of leather and india-rubber. The axle is shouldered to prevent end motion.

[*Printed, 7d. Drawings.*]

A.D. 1854, July 6.—No. 1485.

NICHOLSON, WILLIAM NEWZAM. — Shafts. This invention chiefly relates to certain improvements in the construction of hay making machines, but it also consists in constructing the shafts of such implement and also of various carriages, of tubular iron. The various parts of the shafts are joined by casting on their bosses, elbow or T pieces. Stays are fitted extending from shaft to shaft and attached to such T pieces. A rod passes through the back rail and by its ends the shafts are attached to the vehicle.

[*Printed, 10d. Drawing.*]

A.D. 1854, July 14.—No. 1545.

STOCKER, ALEXANDER SOUTHWOOD.—Axles. This invention consists in constructing axles from tubes. Various combinations are claimed. There may be a series of small tubes surrounding an inner tube the whole being enclosed in a larger tube. There may be a hollow core “strengthened by a “surrounding tube of a larger diameter, shrunk, contracted, “or formed thereon, with suitably formed ends or journals, “hollow or solid, secured in any suitable manner.” There may also be a tube containing a core or strengthening piece of cruciform tri-lateral or other section; and also a combination



of a series of tubes surrounding a solid core, with the ends or journals hollow or solid.

The axles may be galvanized. It is claimed that by these improvements liability to fracture at the shoulder of the journal is obviated "as also by the application of a steel collar " on the outer diameter, and a steel plug or hollow steel core " in the inner diameter of an axle." To prevent vibration the axles may be filled with sand or similar substance.

[*Printed, 10d. Drawing.*]

A.D. 1854, July 17.—No. 1568.

WARCUP, WILLIAM.—Springs. This invention relates to certain improvements upon an invention for which Letters Patent were granted to the present inventor on the 26th May 1853.

It "consists in constructing the **V** or **U** or open angular " double-blade springs, to a plate secured to the under side " of the carriage, waggon, or engine framing, in place of " fitting such springs into the interior of a spring box, as " described in the specification of the former patent herein- " before referred to. In the present arrangement, a series of " **V** or **U** springs are placed side by side, so as to form one " compound or angular double-blade spring; or, if found " desirable, one or two **V** or **U** springs may be used in place " of a series of such springs. Two of these compound springs " will be employed if applied to an axle box, one spring being " situated at each side of such box. The extremities of two " lower series of blades bear upon the top of the grease box, " whilst the extremities of the upper blades will bear against " a plate attached to the under side of the carriage framing. " The springs are attached to the framing by means of a pin " or small roller, on to which are threaded (at their apices) " the several small springs which constitute the compound " springs herein-before mentioned."

[*Printed, 10d. Drawing.*]

A.D. 1854, July 18.—No. 1581.

DALGETY, ALEXANDER.—(*Provisional protection only.*)—Anti-friction axles. Part of this invention relates to a method of surrounding axles by anti-friction rollers. "It is proposed

“ to employ three or more anti-friction rollers working  
 “ against the circumference of the axle journal. These  
 “ rollers are carried by and work in two supporting  
 “ rings, one at each end of the rollers, and these rings are  
 “ connected by means of studs, of a length corresponding to  
 “ the length of the rollers. The rollers are so arranged, that  
 “ although they may all bear upon or against the axle journal,  
 “ yet they are all kept out of contact with each other, by  
 “ which means a great amount of friction is avoided, as,  
 “ when each or any of the rollers are in contact, there neces-  
 “ sarily arises a certain amount of friction, on account of the  
 “ great rubbing which occurs, as both rollers will be revolving  
 “ in the same direction. In place of retaining the rollers  
 “ separate from each other by a couple of solid rings, as  
 “ herein-before described, it is obvious that links or chains  
 “ might be employed; or in place of this, in some cases, a  
 “ pinion may be fitted to each roller, as herein before des-  
 “ cribed, such pinion gearing into circular racks, which will  
 “ always keep the rollers in their respective places, out of  
 “ contact with each other. These rollers are fitted inside the  
 “ axle box or other bearing, and are constantly revolving, not  
 “ only round their own axes, but also slowly round the centre  
 “ of the journal itself; those above the journal bearing  
 “ against the under side of the upper part of the axle box,  
 “ which in this arrangement, would be circular in place of  
 “ square.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, July 21.—No. 1601.

JEAN, ARMAND BENOIT JOSEPH, and HUGUES, ALFRED ALEXANDRE.—(*Provisional protection only.*)—Axle boxes.

The following is the provisional specification:—“ We con-  
 “ struct an axle box whose internal diameter is larger than  
 “ the diameter of the axle, and we place a number of small  
 “ rollers in the annular space between the axle and axle box.  
 “ These rollers are connected together by a ring or annular  
 “ frame at each end, which keeps them at equal distances  
 “ apart. As the axle revolves in the axle box, or the axle  
 “ box revolves on the axle, these rollers roll round between  
 “ them, and thus produce a rolling in lieu of a rubbing  
 “ motion. They are confined endways by a groove or grooves

“ in the axle or axle box. In lieu of these rollers rolling upon the axle itself, they may roll upon a cylindrical block attached to the axle. The rollers may have conical ends, and may be turned of different diameters at the parts which come in contact with the axle or its block, and at the parts which come in contact with the axle box. In lieu of making the axle and box cylindrical, they may be double cones, with two sets of rollers between them, confined by rings or annular frames, as before.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, July 21.—No. 1602.

NEWTON, ALFRED VINCENT.—(*A communication.*)—Spring. This spring consists of a strap or band of thin elastic metal secured by its two ends to a rigid bar. This strap may be corrugated more or less or not at all, and its elasticity as a spring depends upon the proportion of corrugation, and if not corrugated such elasticity is very small being in fact limited by the cohesive resistance of the metal strap to elongation.

[*Printed, 5d. Drawing.*]

A.D. 1854, August 3.—No. 1704.

GERNER, HENRY.—(*Provisional protection only.*)—“ Improve-  
“ ments in the construction of omnibuses, parts of which are  
“ applicable to carriages generally.”

The inventor says, “ I construct omnibuses with a strong  
“ under framework, to which I secure the axles, springs,  
“ wheels, and other requisite parts for draught. Above  
“ this frame I arrange the floor of the omnibus, and divide  
“ it longitudinally with a light iron and wood vertical parti-  
“ tion, against which on each side I affix forms covered with  
“ cushions for seating the passengers, who sit back to back,  
“ separated by the before-named partition ; but sideways  
“ they sit in two continuous lines. By this arrangement I  
“ am enabled to place steps the full length of the omnibus  
“ on each side, which may be so contrived as to pass over the  
“ wheels. My improved omnibus may further have a light  
“ roof, and be enclosed on each side with leather, canvas, or  
“ the like, supplied with suitable small glass carriage win-  
“ dows, and the whole made to roll up ; and a similar attach-

“ment may be made to the framework of the centre partition, so as to leave it entirely open when required, I recommend the fore wheels to be left exposed, and the driver’s seat to be placed above them as customary. My improved anti-friction axle consists of a number of metal rollers, arranged close together within a box in the nave of the wheel, and enclosing the turned end of the axle. The rollers must be of sufficient size to fit closely in the annular chamber they occupy around the axle.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, August 5.—No. 1722.

JOHNSON, JOHN HENRY.—(*A communication from Hippolite Ulysse Petin and Jean Marie Gaudet.*)—(*Provisional protection only.*)—Wheels. A helical coil of malleable iron of a flat section is welded under a steam hammer, the hammer face being shaped as a die while the anvil beneath corresponds to the side contour of a wheel blank. The annular hollow in the upper surface of the wheel blank is formed by a ring of steel or wrought iron placed upon the wheel blank, which is passed upon a central mandril fitting in a socket in the anvil.” Thus a rough wheel blank is formed which is subsequently finished by rolling it outwards by means of a pair of rolls caused gradually to recede from each other as they rotate.

[*Printed, 3d. No Drawings.*]

A.D. 1854, August 8.—No. 1733.

STOY, HUGH.—(*Provisional protection only.*)—Brake. This apparatus, which is described as applied to a railway train, is claimed by the title to be applicable to “vehicles of every description on the common roads.”

The drawing shows a locomotive with the driving wheels raised from the line to act as fly wheels. These wheels are fitted with brakes actuated by a lever or handle, and the motion of the wheels is communicated to the road wheels by rods and cranks.

The train brakes are put on by means of a continuous rod worked by the collapsing movement of the train.

[*Printed, 5d. Drawing.*]

A.D. 1854, August 31.—No. 1906.

KONIG, EUGÈNE.—(*Provisional protection only.*)—"Manumotive carriages.

This invention "relates to the arrangement and construction of wheeled carriages in such manner that the occupants thereof may propel them from within by a simple action of one hand. The wheels and framework of such vehicles may be variously arranged, but a preferable form is that of an elegant arm chair, resting at its hinder part upon the axle of a pair of large disconnected running wheels. The front portion of the frame projects forward at a descending angle from the carriage seat, and it terminates in a horizontal piece cut to allow of the swivelling action of a small front supporting and steering wheel. On one side of this extreme projection is an upwardly curved arm fitted with a loose swivel bearing, for the reception of one end of the short stud spindle of the front wheel. This front steering wheel is thus held entirely from one side, leaving the other side clear for the manual crank action. This free side of the wheel has in its rim, or in one side of its arms, a laterally projecting crank stud pin, for the reception of the jointed end of the occupant or driver's hand rod. The jointed end of this rod is slightly cranked, to enable it to work clear of the wheel and framing, and its opposite end, fitted with a cross handle, projects back into the carriage, so that the occupant, by drawing the rod backward and forward, can act upon the crank pin and turn the wheel, which by its adhesion to the ground thus draws forward the carriage in the manner of an ordinary locomotive engine. At the same time any diverging of the handle to the right or left necessarily swivels round the front wheel, and steers the carriage in the desired path."

[*Printed, 3d. No Drawings.*]

A.D. 1854, September 11.—No. 1975.

JACKSON, PETER ROTHWELL.—Wheels. This invention consists in a method of making wheels by means of pressure or percussion. Heated wrought iron of suitable sectional form is moulded to form the nave, spokes and felloes, or, if thought fit, the nave and portions of the spokes only.

The invention is carried into effect “ by means of a block  
 “ or die, formed in a face or bed plate, furnished with radi-  
 “ ating grooves or channels, opening outwards from the mould  
 “ in suitable positions, form and strength to correspond with  
 “ the spokes of the wheel to be made, and with other suitable  
 “ mechanical arrangements and power, so that the heated  
 “ iron, after having been placed in such mould or die, may  
 “ not only be formed to the shape of such mould, but also  
 “ forced through the grooves or channels radiating therefrom  
 “ to form spokes or parts thereof, and bent, if so desired, at  
 “ their outer ends, so as to make each spoke form a portion  
 “ of the felloe of the wheel.”

[*Printed, 10d. Drawing.*]

A.D. 1854, September 13.—No. 1992.

DURANT, ANGUISH HONOUR AUGUSTUS.—(*Provisional protection only.*)—Axle and axle box.

This invention is thus described by this provisional specification :—“ The working part of my axle consists of a cylinder,  
 “ in which two or other number of broad grooves are cut, so  
 “ as to diminish the working or bearing surface of the said  
 “ axle. The axle box consists of a hollow cylinder fitting the  
 “ axle. Instead of making the broad grooves described in  
 “ the axle, I sometimes make the same in the axle box and  
 “ thereby diminish the friction in the said axle. At the  
 “ bottom of the said broad grooves I cut a fine helical or spiral  
 “ groove, along which the oil or lubricating matter is carried  
 “ and deposited at or near the working surfaces, the said  
 “ lubricating matter being supplied from a reservoir at or  
 “ near the end of the axle box. Although I have described  
 “ my axle and axle box as being cylindrical, yet they may  
 “ be made slightly conical. The same method of reducing  
 “ friction may also be applied to the shafts or axles of machi-  
 “ nery, and to the journals and bearings of the same. The  
 “ axle box is attached to the axle as follows:—A screwed  
 “ ring bears against a collar on the axle, which said screwed  
 “ ring engages in a thread in the end of the axle box, and  
 “ brings the latter up to its bearings against the shoulder  
 “ of the axle; or the axle box may be attached to the axle in  
 “ any other convenient manner. An axle or axle box may

“ according to my invention requires less oil or lubricating matter than an ordinary axle and axle box.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, September 15.—No. 2006.

FONTENAU, FELIX. — (*Provisional protection only.*)—“ Preventing mud from touching or adhering to carriages.”

This contrivance is to be used “ for arresting the mud collected upon wheels when in motion, and causing it to fall to the ground before being thrown off.” It “ consists of a metallic or other rod, terminated by a flat part, lined at discretion with felt or other material, and of the same breadth as the felloe of the wheel. This contrivance may be fixed either to the bolt of the spring, to the axletree, or to any other part of the carriage, and is adapted to the back part of the wheel.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, September 23.—No. 2058.

GENETREAU, HENRY ALEXANDRE.—“ An improved system of carriage shafts, poles, or beams.”

The above articles are to be made flexible in order to reduce risk of breakage. With this object they are made of bamboo or other cane or whalebone combined with metal, the latter being used as a core, ferrules, straps or otherwise, as occasion may require.

[*Printed, 3d. No Drawings.*]

A.D. 1854, September 25.—No. 2059.

MARSHALL, WILLIAM. — (*Provisional protection only.*) — Wheels. The following is the inventor’s provisional specification:—In carrying my invention into effect, I take pieces “ of sheet iron or other metal, and of any required thickness, “ having the figure of a semicircle, quadrant, sextant, octant, “ or other division of circle, and by pressure and dies I press “ a rib or ribs in the said piece of metal, the said ribs being “ in the direction of radii, in the circle of which the said “ piece of metal forms a part. I prefer to use pieces of metal “ having the figure of an octant, and to take eight of the “ said pieces, and placing their straight edges together, con-

“ struct therewith a wheel. In placing the said octants or  
“ other pieces together, so as to form a circular disc, I place  
“ them so that the impressed ribs on one of the pieces shall  
“ be convex, and the pressed ribs on the adjoining piece con-  
“ cave, the concavity and convexity alternating with the  
“ several pieces; I afterwards bind the several pieces together  
“ with a circular bar, which I bind upon the said pieces by  
“ pressure.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, October 4.—No. 2131.

GAULTON, WILLIAM PEEL. — Brakes. This improvement consists in securing the wooden brake blocks to their metal frames or plates by means of toothed or rough faced jaws which are closed upon the blocks by means of screws, bolts, or wedges. By this means the usual wood screws or bolts are rendered unnecessary, and the consequent weakening of the block obviated.

[*Printed, 6d. Drawing.*]

A.D. 1854, October 30.—No. 2309.

JOHNSON, JOHN HENRY.—(*A communication from Benjamin Laurent.*)—Axleboxes. The outer end of the axlebox has a rim or rib which narrows its mouth. The axle is made of smaller diameter where it passes through this aperture and a nut is screwed on to it at the outside of the aperture. The nut consequently abuts against this rim or front edge of the axlebox and rotates with the axle. A screw cap fits over the end of the axlebox and encloses the nut above-mentioned. The cap may be kept supplied with oil through a stoppered aperture. At the inner end of the axlebox an annular groove or recess is contrived in the substance of the box. This is used to hold grease and a grooved collar round the axle at the part which rotates in this recess, assists in retaining the lubricating material.

[*Printed, 7d. Drawing.*]

A.D. 1854, November 1.—No. 2323.

NEWTON, ALFRED VINCENT.—(*A communication.*)—Forging iron wheels. A block of heated iron is swaged or hammered



within a die of proper form. This die or anvil is caused to rotate intermittently with the blows of the hammer. The face of the latter is corrugated or waved "in the line of a circle concentric with the hub, that is, formed with alternate projections and recesses extending from the hub to the rim, or nearly so; the effect of which projections and depressions, in combination with the intermittent rotary motion of the anvil die, or hammer swage, is to spread the metal towards the circumference, and thereby insure the reduction of the thickness of the block of iron between the hub and rim, and forcing it to the rim."

[*Printed, 7d. Drawing.*]

A.D. 1854, November 1.—No. 2325.

FRANCIS, JOSEPH.—"Waggon, caissons, and other vehicles applicable to transport military and other stores on land and water."

These vehicles are to be made of corrugated iron so as to be able to float, with their burdens, across watercourses. "The waggon body" says the patentee, "is made of any usual or convenient shape, and its bottom, sides, and ends are entirely composed of corrugated iron. The upper edge turns over at right angles all around and then down, and the space thus formed is fitted with a top rail of wood. All the joints are made watertight, and the lower portion of the tail board is fixed permanently, a small portion only of the upper part turning down, which when in place may have a water-tight joint by means of cotton, flannel, or other cloth, if required, at each of the corners on the inside. I place angle iron or corner pieces, strongly riveted to the sides and ends, to prevent breakage or leakage, and fill the openings caused by the corrugations with solder and cement of red lead and oil; all the other appendages of an ordinary wooden waggon are also affixed thereto. This forms the superstructure, and it rests upon and is attached to a wooden framework, formed of two side and two end pieces, framed together with cross pieces intervening; the rear end piece projects beyond the sides, and sustains a diagonal brace that supports the sides at that point. A centre brace may also project in the same way for a like purpose. This

“ framework, thus fashioned enables me to affix the running  
“ gear of the waggon without piercing the bottom with holes,  
“ a matter indispensable to avoid leakage. To the front end  
“ of the frame the bolster is screwed so that it can be detached  
“ readily from the running gear and wheels, and thus the  
“ body alone can be used as a boat. The king bolt passes  
“ through the bolster, with its head countersunk below the  
“ top of the bolster, and having an iron plate firmly secured  
“ to the bolster over the head of the bolt. By this means I  
“ avoid making a hole through the bottom of the waggon,  
“ as before stated, and when the bolster is removed with the  
“ running gear, the body can be drawn along upon the timber  
“ frame as upon skids, or on the snow as a sleigh, dispensing  
“ with the wheels; the corrugated flanges, &c. giving support  
“ and strength to bear the concussions of a rough road without  
“ any chance of injury to the structure. In rapid transit or  
“ where from any cause the running gear is not unshipped,  
“ a loaded waggon can be drawn directly into the water, and  
“ floated across the stream without unloading or injury to the  
“ contents. Without the running gear each waggon can be  
“ employed as a batteau; if occasion require the box in front  
“ can be of the shape” described “or may be formed more  
“ like the bows of a boat if required.

“ This mode of construction is applicable to the construction  
“ of caissons and other structures for military purposes. The  
“ sides are made of one piece struck up into shape with a die.  
“ I make the ammunition bodies and caissons with a corru-  
“ gated top or cover to open in sections for convenience in  
“ taking out powder. These are fire and waterproof and also  
“ made to be used on wheels as waggons on snow as sledges,  
“ or sleighs, on rivers as boats, batteaus, &c.; and to trans-  
“ port powder and fixed ammunition without unloading, thus  
“ avoiding the exposure to injury of the materials or loss of  
“ life by explosion.”

[*Printed, 7d. Drawing.*]

A.D. 1854, November 7.—No. 2357.

METCALFE, THOMAS.—Portable chairs, carriages, &c. A large number of vehicles of various patterns and for different purposes are shown and described by this specification. They

all show modifications or adaptations of the patentee's system of construction which consists of crossed rods or bars arranged as two frames connected by pivots at their intersection and having wheels at the bottom corners and straps or bands suspending the carriage body at the other corners. If a wheel were supposed to be applied to each of the feet of an ordinary portable tray stand, and the straps of the latter were taken to represent the carriage body, a good idea of the patentee's system would be gained. The wheels may be removed for convenience of packing. "A similar arrangement of folding arms or cross framing may be adapted to carriages with rigid bodies with advantage, or by the length of the arms a considerable amount of elasticity is obtained, and therefore the use of springs may in some cases be avoided." Handles for propelling are added and these may be at the side also if desired.

Ambulances, wheelbarrows, trucks, light carts and waggons, invalid chairs, perambulators and other vehicles are named as being carefully constructed on this system.

[*Printed, 1s. Drawings.*]

A.D. 1854, November 10.—No. 2394.

RIMMEL, EUGENE.—(*A communication from Hippolyte Magen.*)—Artificial leather or waterproof cloth. A substitute for india-rubber as a waterproofing material is made by dissolving together in water, alum, sulphate of iron and soap, by preference of seal oil and potash. When evaporated to a pasty state boiled linseed oil is added and then some unboiled oil. This is applied first as a coating. The next coat consists of a thin mixture of the above with colouring matter. In making more solid compounds more sulphate of iron is used with sulphur and heat is applied for a longer time.

Several preparations are given in detail, one of which may be used as a varnish for real or artificial leather. The method of application to the fabric is described. A roller apparatus with an upright knife is used to spread the composition, which is afterwards pumiced before the next coat is applied.

The material so prepared is claimed as being useful for "coach making," &c.

[*Printed, 3d. No Drawings.*]

A.D. 1854, November 17.—No. 2444.

COULSON, WILLIAM.—Morticing and boring wheel naves, felloes, &c. The nave is adjusted on a frame beneath a boring tool, the parts in which borings are to be made being ascertained and set out by means of an index plate and index. The tool is then lowered on to the nave by a hand lever and rotary motion communicated to the drill in the usual way. The hole being bored, the tool is allowed to resume its former position by the action of a counterweight. As soon as all the holes are bored, the nave is carried by the frame under the morticing chisel, which is raised and lowered by a counter-balanced lever, and makes a cut at each descent.

[*Printed, 6d. Drawing.*]

A.D. 1854, November 20.—No. 2454.

ADAMS, WILLIAM BRIDGES.—(*Provisional protection only.*)—"Improvements in projectiles, projectile weapons, and their appurtenances."

These improvements relate chiefly to projectiles and guns, but the inventor also claims as improvements "springs of caoutchouc or steel for field artillery," and "wheels with elastic spokes, to prevent concussion and diminish the draught of field artillery." No description is given of these details.

[*Printed, 4d. No Drawings.*]

A.D. 1854, November 27.—No. 2498.

DE] FONTAINEMOREAU, PETER ARMAND le Comte. — (*A communication from Messrs. De-flassieux, Peillon and Brothers.*) — Manufacture of iron wheels. The various parts of these wheels are first made separately. They are then put together and heated to a welding heat. The mass is then forced into a mould, turned and again forced in by a hammer or press having a counterpart mould or die formed in it. The rough edges are trimmed off and the wheel is finished.

[*Printed, 5d. Drawing.*]

A.D. 1854, December 1.—No. 2529.

WILSON, THOMAS.—(*Provisional protection only.*)—"Preventing the noise in omnibuses and other carriages travelling on common roads, streets and railways."

This invention consists in “the introduction of india-rubber blocks between the axletree and springs, in place of the wood blocks now in use.” The noise arising from the windows is prevented by lining the said windows and frames “with india-rubber.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, December 2.—No. 2543.

DOWLING, EDWARD.—Sack barrow and weighing machines. By this combination “a considerable weight of goods may be weighed without the necessity of carrying any large amount of counterbalance weights.” The fulcrum of the steelyard is suspended “by two supports from the upper cross bar of the barrow, and” “the frame of the goods scale” is suspended “in front of the barrow, with the scale pan a little above the iron shoe. The levers are in duplicate, one on either side, inside the side frames of the barrow and outside the supports of the fulcrum, which is a bar stretched between the two levers. The long ends of the levers project out at the back part of the sack barrow, and are united at the extreme, so as to form a rectangular frame. Two separate rods of equal length are placed parallel to and between the main frame or levers, on which the weights are placed. These rods are graduated from the fulcrum in the ordinary manner of a steelyard; the one carrying the heavier weight indicating the quarters or other denominations of weight, while the smaller weight, which has a traverse of the same extent, indicates the intermediate amounts. In collapsing, the goods scale folds up in front, while the long end of the lever folds down at the back of the barrow, and by reason of the disposition of the supports of the fulcrum, the levers and suspending rods are allowed to fold within the limits, and to be flush with the side rails of the barrow. The goods scale, which is suspended by a rectangular frame, has suitable stops on which to rest the weight of goods, and is properly connected to maintain the necessary freedom of motion; a folding bracket piece is attached to the side of the barrow at the back, which bracket is placed in position to limit the up and down movement of the tail or long end of the lever in weighing, and is also applicable for holding the machine in the collapsed position. The fulcrum bar and other parts

“ of the machine are suspended, so that the whole may be  
“ easily removed from the barrow, which may then be used  
“ without the encumbrance.”

[*Printed, 9d. Drawing.*]

A.D. 1854, December 7.—No. 2577.

METCALFE, THOMAS.—(*Provisional protection only.*)—Bath chair. This improvement is thus described by the inventor :—“ The chair consists mainly of two skeleton frames jointed  
“ together, after the manner of the ordinary folding chair,  
“ and similarly provided with jointed arms. These frames I  
“ mount on wheels, which may be removed at pleasure to  
“ allow of castors being applied to the axles of the wheels.  
“ Sacking or other cloth is secured to the frames to form the  
“ seat and back of the chair or cushions, or a folding mattress  
“ may be used for that purpose. To the upper end of the  
“ frame, which constitutes the back of the chair, I joint a  
“ head frame, and to the lower end of the same frame I joint  
“ or otherwise secure a front frame, which is intended to  
“ support the forward end of a canopy, the hinder end being  
“ attached to the head frame. To the upper end of the frame,  
“ to which the hinder wheels are attached, I joint a frame  
“ which carries a foot board, and over which the canvas or  
“ other covering for the frames may extend. To keep the  
“ parts in position, I employ quadrants and stop pins, or their  
“ equivalent. This construction of chair will admit of being  
“ folded up into a very small space for transport; the foot  
“ board and head frame folding under, the main frames  
“ folding into each other, and the frame in front for carrying  
“ the canopy folding upon the main frames. This chair also  
“ admits of being used as a couch or bedstead.”

[*Printed, 3d. No Drawings.*]

A.D. 1854, December 19.—No. 2674.

GLOVER, FREDERICK ROBERT AUGUSTUS.—Springs for carriages. This invention has reference to a previous patent granted to the present inventor on 7th April 1854 (No. 807), and consists in the application of the springs therein described to carriages. One of the open ends or limbs of the forks is attached to the axle, the other to the body, and the closed end

is fixed to the frame in such a way as to allow for the necessary play or action of the spring.

The patentee's "spring shafts" may also be fitted to four-wheeled carriages, by attaching one limb to the axle and the other to the moveable or turning frame of the fore carriage.

[*Printed, 8d. Drawing.*]

A.D. 1854, December 21.—No. 2698.

JOHNSON, JOHN HENRY.—(*A communication from Hippolite Ulysse Petin and Jean Marie Gaudet.*)—Manufacture of iron wheels. A blank is first made by coiling a bar of malleable iron of a flat section. This is heated and roughly shaped between dies formed on the anvil and head of a steam hammer. The blank is now less in diameter than the finished wheel is intended to be. It is then placed on a vertical mandril or support and acted upon by a pair of rollers on horizontal axes which grasp the blank between them. These rolls travel to and fro in a horizontal direction from the centre of the blank to the periphery and in their movement roll out the wheel. The upper roll axis has at first an inclined position which facilitates the operation. The edge of the wheel is formed by a horizontal roll placed between the other two. Instead of causing the rolls to move horizontally, the blank itself may be moved by a traversing mandril or carriage.

[*Printed, 1s. 4d. Drawings.*]

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## 1855.

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A.D. 1855, January 6.—No. 41.

EDWARDS, CHARLES JOHN, junior, and FRASI, FREDERICK.—Leather bearings. The invention is thus described by the patentees:—"We employ by preference, ox hides, either "tanned, tawed, or otherwise prepared, and cut them up "into pieces of suitable size for lapping half round the "journal to which they are to be applied, and we compress "such pieces in moulds to bring them severally to the "required shape. In order to obtain a good thickness of

“ bearing, we cement two or more moulded pieces of leather together in layers, and then give the bearing a final compression in a suitably shaped mould. Or we stamp out pieces of leather to the required sectional form of the bearing, and cement them together in number sufficient to produce the required breadth of bearing surface, and submit the bearing thus composed to lateral pressure. These bearings we varnish over (except the concave bearing surface) with a composition of isinglass and spirits of wine, or other analogous substances to make them impervious to oil, and this compound we also prefer to employ as the cement for connecting the layers or pieces of leather together. When requisite we propose to back the bearings with metal.”

The “ bearing surface may be made by twisting a strip or strips of leather spirally round a conical core, like the end of the axle to which it is to be applied and then submitting the so-coiled leather to pressure.”

[*Printed, 6d. Drawing.*]

A.D. 1855, January 9.—No. 53.

OFFORD, JOSEPH.—Carriages. This invention consists in so arranging carriages that the fore and hind wheels may be brought closer together. Instead of placing the doors at or near the centre of the carriage, they are placed at the front or hind corners, according to the disposition of sitting room preferred. When the door is open it forms a guard to the wheel; and the seat is raised or swung back to allow admittance. The axle of the fore wheels is made shorter, by which the locking distance is reduced. A perch is also adapted, and **C** springs with a brace connection employed. The curved wheel guards of the front wheels may be attached to springs and thus turn with the fore carriage.

[*Printed, 8d. Drawings.*]

A.D. 1855, January 10.—No. 65.

FULLER, WILLIAM COLES.—Springs. The first of these improvements relates to the construction of an india-rubber suspension spring. This may be made of either a ring or series of rings of india-rubber or of one continuous cord, each



end being fastened, stretched over two reels or sockets of metal. "Before securing the ends of each spring it is necessary to stretch" it "to the utmost length at which it will require to be used. In this state the ends should be firmly secured either by a binding of tape, cord, wire, or other suitable material or in some cases by means of metal plates and screws, and as the action of the spring will be confined to the middle part, the ends will be secured from friction." The elasticity of springs of this class may be controlled by combining them with canvas or other material.

The invention also relates to a method of attaching axles to carriages. A bar is fitted to the axle like the lower half of an elliptic spring. Two scrolls are attached to the carriage and these are connected with the ends of the bar on the axle by india-rubber springs. Many modifications of this principle suited to varied requirements, in combination with a perch and otherwise, are shown.

A spring for heavy vehicles similarly arranged is shown as consisting of india-rubber rings compressed between plates on a central bar.

. A further improvement consists in fitting india-rubber spring shackles in various ways to the ends of steel springs.

[*Printed, 11d. Drawings.*]

A.D. 1855, January 18.—No. 130.

SURGEY, JOHN BAILEY.—(*Provisional protection only.*)—Two-wheeled carriages. The inventor says "I construct a carriage with seats placed alternately facing the two sides of the vehicle. Thus, if the first seat faces the right side of the carriage, the second seat will face the left, and the third seat (when three are used) will face the right, and so on according to the numbers to be accommodated. The width of the carriage is thus reduced to that required for one person sitting sideways. Any or all of the seats may be hinged, and made to turn up or down, so as to give free ingress and egress. The axle may be bent, so as to pass under the body of the vehicle, or it may pass through the body either straight or bending between or under any of the seats. I also construct carriages similar to that above described, but having a seat on one side only, two or more persons sitting side by side and travelling in the direction

“ of the seat’s length. In these carriages the driver’s seat is  
 “ placed at the top or in front, and may be moveable back-  
 “ wards, forwards, or sideways, as occasion may require, to  
 “ adjust the balance or trim of the carriage. Over the  
 “ driver’s seat I place a canopy, roof, or framework, either  
 “ fixed or or moveable, or more or less collapsible. The  
 “ framework is covered with waterproof canvass or other  
 “ suitable material, which may also be carried down to the  
 “ roof of the carriage behind the driver, or at the sides to  
 “ protect him from the weather. I also apply a canopy for  
 “ sheltering the horse in wet or very hot weather, consisting  
 “ of waterproof or other suitable material, fixed at one end to  
 “ part of the carriage, and so suspended so as to allow of the  
 “ other end being easily drawn forwards and withdrawn  
 “ again; the covering when in use being kept clear of the  
 “ horse by suitable contrivances for stiffening it, either  
 “ attachable to the harness or shafts of the carriage, or  
 “ forming part of the covering itself. I also construct a  
 “ one-horse carriage, which is capable of turning in a very  
 “ small compass, by placing a wheel on each side of the  
 “ horse, with a separate axle to each wheel, or with the  
 “ axle passing under the belly of the horse, or over its back,  
 “ or round it; seats for passengers are constructed over  
 “ the wheels, or (in cases where width is not objectionable)  
 “ between each wheel and the horse’s side. In connection  
 “ with these seats a framework is carried up, to support a  
 “ seat for the driver over the horse’s back, but not touching  
 “ it. This arrangement may be made with an additional  
 “ wheel or wheels, and in combination with that herein-  
 “ before described, so as to carry passengers or freight partly  
 “ at the sides, partly over, and partly behind the horse.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, January 26.—No. 195.

TOWNSEND, WILLIAM.—(*Provisional protection only.*)—Sus-  
 pending carriages. This provisional specification describes  
 this invention as applied to a two-wheeled vehicle. There  
 is no axle but the wheels revolve each on a fixed arm or  
 centre outside the body. On each side of a wheel is placed a  
 block to which the fixed centre or short axle is attached. On  
 each block is placed either a spring, or a rigid bar of similar

shape. The spring, or bar, is attached by the ends to vertical standards; and beneath the wheel blocks are also attached guide rods or bars which slide up and down on the vertical standards. The standards are firmly secured to the carriage body and they communicate the load to the wheels.

[*Printed, 6d. Drawing.*]

A.D. 1855, January 26.—No. 199.

BELL, GEORGE.—(*A communciation.*)—Air springs. An iron box or case contains the air. If great pressure exists at times the case should be lined with tin. There is a flexible diaphragm made by preference of canvas and india-rubber. The joints between this diaphragm and the box or other necessary parts, and likewise the aperture through which the air is introduced, are closed by means of water or other liquid, of which the box contains a sufficient quantity.

[*Printed, 6d. Drawing.*]

A.D. 1855, February 6.—No. 277.

ASTON, THEO.—(*Provisional protection only.*)—"Carriage telegraph."

This improvement consists in placing outside the carriage in a convenient position for the drive, an indicator or dial capable of giving signals or directions of a given description. A similar dial is placed within the carriage, and by turning a pointer to the required position thereon, a bell is rung on the other apparatus and the indicator set as required.

[*Printed, 3d. No Drawings.*]

A.D. 1855, February 7.—No. 293.

BRIGGS, GEORGE.—Spring. This spring consists of an "under elliptical spring," the ends of the top plate of which are turned up and form eyes, to which are attached the extremities of a leather brace. The "upper spring" is somewhat of the form of a  $\Lambda$  flattened at the top, and with an extended base. The leather brace is fastened by clips close to the whole of the underside of this upper spring.

This spring is said to be more easy, and to be free from "drumming" noise.

[*Printed, 6d. Drawing.*]

A.D. 1855, February 9.—No. 306.

ADAMS, WILLIAM BRIDGES.—Springs. In order to dispense with the use of central bolts or studs in laminated springs for the purpose of securing the proper juxta-position of the plates, the patentee indents each plate “either in a sharp angle or in “a curve” at the centre, so that when the clips are fixed the plates cannot move. He also proposes in some cases to arrange the shorter plates above instead of below the main plate, and in this case applies the load at the centre instead of the ends of the spring. He also separates the plates from each other at the end so that they come into action successively. The ends of these diminishing or shorter plates may also be square or untapered, the exterior edges being rounded or bent “to prevent cutting in.” Various modifications of these springs are shown, some combined with india rubber cushions or rings.

Another spring, to be used for traction purposes, consists of a spiral or coiled spring, the traction rod passing through the centre. This is a modification of part of the invention No. 11,445, A.D. 1846.

The rest of the invention relates to the application of springs “to form an elastic adjustment for collars and half collars” to axles to keep in the lubricating substance, and to exclude dirt. This is an improvement on the axle box described in No. 11,715, A.D. 1847.

[*Printed, 10d. Drawing.*]

A.D. 1855, February 14.—No. 338.

PATTINSON, HUGH LEE, junior.—(*Provisional protection only.*) —“An improvement in the manufacture of iron carriage wheels.”

The only description given is as follows:—“This invention has for its object the employment of wrought-iron tubes or wrought iron of a hollow form, for making the hoops or felloes of carriage wheels.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, February 15.—No. 342.

LEADBETTER, JAMES. — (*Provisional protection only.*) — Brakes. The inventor describes his improvements as follows: —“Instead of the usual method of applying break blocks to

“ the periphery of the wheels to stop or retard their progress, I propose to fix on each axle or cross shaft a pulley or a toothed wheel, on which shall act a spring connected to a draw bar or continuous chain, which when acted upon will stop or retard the revolution of the wheels. If pullies are used, I cause the spring to encircle both of them, and make a hole or slot in it so as to catch upon a pin or projection when the connecting rod or chain is drawn forward by the breaksman, and thus stop the revolution of the wheels. If toothed wheels are used instead of the pullies, I cause the springs, or, if desirable, two pieces of rigid metal with the ends turned a little, to catch one of the teeth of each wheel when the connecting bar is drawn forward, and thus stop the revolution of the wheels. Instead of the connecting bar under each carriage which have to be connected by chains, I can use one continuous chain to act upon the levers, which cause the springs or rigid projections to act upon the pullies or toothed wheels, and fix an additional pulley or drum in any convenient position, so that it may be turned by the person in charge of the breaks, by which he will attach all the springs or rigid projections, and thus stop the revolution of the wheels. Although I have here described my invention as applicable to railway carriages, it is obvious that it may be applied to carriages on common roads.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, February 17.—No. 360.

HACKETT, JOHN.—(*Letters Patent void for want of Final Specification.*)—Leather cloth. “My invention,” says the inventor, “consists in the employment of a fabric or fabrics of superior quality to that now in use, as a substratum or ground for the material that is to give it the appearance of leather, or to convert it into a leather cloth.

“The fabrics I use are, first, one consisting of at least two-thirds of the warp threads and two-thirds of the weft threads of doubled and twisted cotton. Secondly, one consisting of at least two-thirds of the warp threads of doubled and twisted linen, and at least two-thirds of the weft threads of doubled and twisted cotton, or *vice versa*. Thirdly, one composed of at least two-thirds of the warp threads, and also of two-thirds of the weft threads of doubled and twisted

“ linen. I intend to apply my improved leather cloth to the  
“ following purposes:—The lining and padding of railway  
“ carriages, and making and covering cushions for the same;  
“ the lining and padding of coaches, chaises, gigs, landaus,  
“ cabriolets, omnibuses, and every description of travelling  
“ carriages,” &c.

[*Printed, 3d. No Drawings.*]

A.D. 1855, February 17.—No. 361.

OXLEY, JOHN.—Wheel making machinery. “ This invention  
“ relates to a peculiar combination and arrangement of ma-  
“ chinery employed in cutting out, shaping, or forming the  
“ spokes of wheels, and in forming the tenons or tangs of  
“ such spokes, and consists:—

“ First, in the employment of two circular saws running  
“ parallel to each other, and so arranged that the distance  
“ between them may be varied at will, by levers or other suit-  
“ able means. These saws are for the purpose of cutting the  
“ spokes of wheels on two sides simultaneously to any required  
“ thickness, the rough unshaped spoke having been previously  
“ fixed in such a manner on centres that by turning it through  
“ a quarter of a circle it may be similarly cut on the other  
“ two sides to any required dimensions.

“ Second, in the employment of two revolving cutters for  
“ the purpose of forming a tenon on the end of the spoke.  
“ These revolving cutters are so arranged that by pushing a  
“ pattern between the carriages which support them, they  
“ will be gradually forced asunder, and so form the required  
“ tenon on the end of the spoke which is entered between  
“ them, such spoke resting upon the sliding plate or table to  
“ which the pattern herein-before referred to is attached.

“ Third, in the employment of a revolving cutter in combi-  
“ nation with a wedge-shaped sliding table, for the purpose  
“ of cutting the tenons of the spokes to the requisite width  
“ and taper.

“ Fourth, in the employment of two pairs of revolving  
“ cutters, for the purpose of forming tenons with square  
“ shoulders on the ends of the spokes, one pair of these re-  
“ volving cutters working at right angles or nearly so to the  
“ other pair, thereby forming the square shoulder required.

“ These cutters by means of moveable carriages are capable  
“ of being set to cut any required length or thickness of  
“ tenon.

“ Fifth, of an improved arrangement of spoke shaping machine, wherein a revolving cutter is used, the knives of such  
“ cutters being fixed parallel to the spindle which carries  
“ them, the spindle itself working in a headstock or bracket  
“ which moves horizontally at right angles to the spoke. The  
“ spoke, while under operation, revolves on fixed centres.  
“ The motion of the headstock or bracket is governed by  
“ suitable springs and a pattern spoke.

“ Sixth, of an improved system or mode of fixing the spoke  
“ during the process of shaping, by means of an expanding  
“ and contracting gripper, which revolves and holds one end  
“ of the spoke while it runs on a common centre at the other  
“ end. The gripper which is placed at the end farthest from  
“ the workman or attendant, is actuated by a series of toothed  
“ wheels in connection with a conical nut, by which arrangement the attendant is enabled to fix or remove the spokes  
“ without moving from his place.

“ Seventh, of a peculiar system or mode of forming square  
“ tangs or tenons on the outer ends of the spokes after they  
“ are driven into the nave. This is accomplished by placing  
“ the nave and spokes horizontally on a centre pin, and in  
“ position passing the ends of the spokes successively between  
“ two pairs of vertical and horizontal revolving cutters, which  
“ are so arranged so as to be set to cut any required size of  
“ tang or tenon.

“ Eighth, of a peculiar system or mode of forming round  
“ tangs or tenons on the ends of the spokes after they have  
“ been driven into the nave. This is effected by placing the  
“ nave on a centre pin, which is fixed into and stands at right  
“ angles to a horizontal revolving shaft constructed and  
“ arranged in such a manner as to admit of the ends of the  
“ spokes being brought in succession in a line with their own  
“ centres, so that each spoke may successively and while  
“ revolving in this centre line, be acted upon by a revolving  
“ or fixed cutter, which forms a round tenon of any required  
“ size upon the outer ends of such spoke.”

[*Printed, 2s. 5d. Drawings.*]

A.D. 1855, March 8.—No. 516.

HAZELDINE, GEORGE.—Wheels and carriages. The carriage here described is on two wheels, though the invention is claimed as useful for four-wheeled vehicles. Each wheel runs on a short fixed axle attached to a framing which surrounds the body. The framing on each side is made double, so that the wheel runs between two bars. To each bar is attached a half spring, and the body is steadied by irons which are furnished with india rubber springs which come into action when the vehicle is more than usually loaded. By this arrangement the body may be brought nearer to the ground.

The invention is shown applied to an ambulance. The doors are at the rear, mounted on long hinge bars, so that if the body should be sunk low in the framing the doors may still be opened by first raising them. The interior is fitted with beds arranged longitudinally, and capable of folding up against the sides when not in use. A water cistern and case for stores are placed on the top, and the body is ventilated through the front and back. A pair of shafts and a swingletree supply the draught.

In order to enable wheels to travel on soft ground, broad tire segments are attached by bolts. They are broader than the inner tire, and removable at pleasure.

[*Printed, 10d. Drawing.*]

A.D. 1855, March 8.—No. 526.

GERARD, JOHN.—(*Provisional protection only.*)—"A portable floating pier or bridge, separating into sections, which are designed and adapted for forming floating vessels; also fixed and moveable structures on land, such as sheds and vehicles."

The invention "consists of portable floating vessels with moveable water-tight decks, sides, ends, and bottoms, and sliding or folding frames, platforms, stays, and supports, the whole being made and fixed together in sections composed of and separating into duplicate parts designed for forming a portable extending pier, bridge, or platform for facilitating the embarking and disembarking passengers, troops, cattle, stores, or merchandise, or for effecting a passage or forming a roadway across the water; the said



“ sections and duplicate parts being also designed and intended  
 “ for forming works or buildings of defence, shelter, or stores  
 “ on land, and also adapted for forming waggons or other  
 “ vehicles. Each vessel, structure, or vehicle can be fitted  
 “ together or separated with facility and dispatch, and packed  
 “ together so as to occupy a comparatively small space for  
 “ shipment or removal when not in use.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, March 24.—No. 649.

SCOTT, URIAH.—(*Provisional protection only.*)— Carriage wheels, axles, and springs. The first part of this invention relates to the construction of carriages for the purpose of facilitating praught. Three wheels are used, the single wheel being being placed in front or rear according to circumstances. It is as large or larger than the other, and is carried on a short axle. The springs resemble an elliptic spring bent sideways like a bow. The ends of the springs are connected by india rubber. India rubber cushions are also fitted to the turning carriage. When the wheel is in rear, the seats may be arranged back to back, the wheel turning in a space “that  
 “ would form the leaning back of the passengers.”

The construction of the wheel the inventor describes as follows:—“ In the construction of its nave, which I recommend should be of iron, though this does not affect the  
 “ principle, I first take a metal case or tube, which may or  
 “ may not form and be used as the axle box; if the former,  
 “ its size must, of course, be proportioned to the size of the  
 “ axle to be used; but if the present or an independent axle  
 “ box is to be retained, my metal case must be large enough  
 “ to admit the other to be keyed into it, as it would otherwise  
 “ be into an ordinary nave. On and around this case is  
 “ attached a metal flange or washer near to the larger end or  
 “ shoulder; then against this flange or washer I place a ring  
 “ of india rubber or other similar elastic material. I then  
 “ introduce upon my case a half round ring or false nave of  
 “ wood or metal, as may be desired; the latter I would much  
 “ prefer, and in which are cut or cast the mortice beds for the  
 “ spokes; then with another ring of india-rubber or other  
 “ elastic material, and another flange or washer, I complete  
 “ my wheel. I will now proceed to describe my periphery or

“ filly, which like my nave may be either constructed of wood  
 “ or iron; if the latter, it will simply resolve itself into a  
 “ double tire, and between which I introduce cushions of  
 “ india-rubber or other elastic material, secured by screws  
 “ both from the inside and from the outside, in such a manner  
 “ as shall not admit of the slightest metallic connection be-  
 “ tween the outer tire and the inner or filly of the wheel. If,  
 “ on the other hand, I require no metal tire, I employ certain  
 “ lengths of india-rubber instead of the blocks or cushions  
 “ before mentioned, and secure them by screws in the same  
 “ manner as before to the filly of the wheel. The screws  
 “ will have a firm hold in the rubber by first having inserted  
 “ a light piece of metal or small nut into that part to which  
 “ the screw is to be applied.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, April 5.—No. 765.

HOLMES, HERBERT MOUNTFORD.—Tires. “ This invention  
 “ has for its object improvements in the manufacture of the  
 “ tyres for wheels, in order to suit the wheels to run at  
 “ different times on hard land and soft, as circumstances may  
 “ require. For this purpose the tyre for the wheel is rolled  
 “ on its exterior surface with a projecting longitudinal rib  
 “ which may be square or rounding, so that when the wheel  
 “ is on a hard road or surface, the tyre will run on its longi-  
 “ tudinal rib, but when on soft land or surface the rib will  
 “ penetrate, and the whole breadth of the tyre will rest on  
 “ the land or surface.”

[*Printed, 5d. Drawing.*]

A.D. 1855, April 5.—No. 767.

DURANT, ANGUISH HONOUR AUGUSTUS.—Axle and axle box.  
 The patentee thus describes his invention:—“ The working  
 “ part of my axle consists of a cylinder in which two or more  
 “ grooves are cut, so as to diminish the working or bearing  
 “ surface of the said axle. The axle box consists of a hollow  
 “ cylinder fitting the axle. Instead of making the broad  
 “ grooves described in the axle, I sometimes make the same  
 “ in the axle box and thereby diminish the friction on the  
 “ said axle. At the bottom of the said grooves I cut a fine

“ helical or spiral groove, along which the oil or lubricating  
 “ matter is carried, and deposited at or near the working  
 “ surfaces, the said lubricating matter being supplied from a  
 “ reservoir at or near the end of the axle or axle box. Al-  
 “ though I have described my axle or axle box as being  
 “ cylindrical, yet they may be made slightly conical. The  
 “ same method of reducing friction may also be applied to the  
 “ shafts or axles of machinery, and to the journals and bear-  
 “ ings of the same. The axle box is attached to the axle by a  
 “ ring bearing against a collar on the axle, which said screwed  
 “ ring engages in a thread at the end of the axle box, and  
 “ brings the latter up to the bearing against the shoulder of  
 “ the axle; or the axle box may be attached to the axle in  
 “ any other convenient manner. An axle or axle box made  
 “ according to my invention requires less oil or lubricating  
 “ matter than an ordinary axle and axle box.”

[*Printed, 5d. Drawing.*]

A.D. 1855, April 18.—No. 851.

DAMERON, LOUIS.—(*Provisional protection only.*)—Convertible carriage. This carriage may be converted at pleasure from one capable of seating four persons to a two-seated carriage and may also be made into an open carriage. To convert the two-seated to a four-seated vehicle a moveable front is put on behind the box seat. This and the top, with the upper parts of the doors, are to be removed when the carriage is to be thrown fully open.

[*Printed, 6d. Drawing.*]

A.D. 1855, April 19.—No. 875.

JOHNSON, JOHN HENRY.—(*A communication.*)—Manufacture of articles of india-rubber.

This invention consists in moulding articles of soft india-rubber compound and then submitting them to considerable heat in steam heaters or to the action of a sulphur bath. The moulds which may be made of various materials, may be filled with solution of gum in spirit or “carburet of sulphur,” or with the pure gums themselves which may then be vulcanised.

So much of the invention as is to be included in the present series, however, relates to a proposition to cover with pure

india-rubber, "carriage ware" and other articles, "the material being submitted to the process of hard vulcanization in a sulphur bath; or the articles may be plunged into a solution of india-rubber or gutta-percha formed by the carburet of sulphur, or into any other solution" of such gums "and then vulcanised hard."

[*Printed, 4d. No Drawings.*]

A.D. 1855, April 25.—No. 921.

AVISSE, LOUIS ALEXANDRE.—Axle box. Two descriptions of axle box are described in this specification, which also relates to methods of lubricating other revolving articles. In one axle box a cavity is conducted above the bearing to hold water for the purpose of keeping the axle cool. The lower part of the box contains the oil in which the axle partially rotates. The axle has a rib round it running in a groove and it is also grooved to take ribs on the bearings and thus prevent end movement.

The other form of axlebox has the upper cavity but instead of water it contains oil. The oil flows from it through small tubes to a longitudinal groove in the underside of the bearing whence it lubricates the axle. After passing round the axle it is collected in the lower part of the box. When it reaches a certain level it is taken up by the axle, which then partially revolves in it, aided by the ring thereon. Any overflow of oil passes into another receptacle whence it can be drawn off. Both boxes are fitted with graduated glass covers or gauges, so that the quantity of oil can be seen easily.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1855, April 25.—No. 926.

BLACK, JOHN.—Axles and axle-boxes. In those cases where the axle revolves it is fitted with a collar or rib which runs in a hollow in the bearing. This hollow contains the oil, which is supplemented from a receiver on each side of the axle box. The oil is taken up by the revolving rib for the purpose of lubricating the bearings. When the axle is fixed the nave of the wheel has two such collars, one at each side, the intermediate space serving for the oil, which is supplied through a screwed aperture.

[*Printed, 7d. Drawing.*]

A.D. 1855, April 27.—No. 948.

COIGNET, ROBERT PAUL.—Waterproofing. This invention consists in preparing a waterproof fabric or artificial leather by the use of the following composition :—“ Flax oil 100 parts, “ thick oil of pitch 25, liquid rosin 5, mineral pitch 2, white “ rosin 5, Norwegian pitch 5, Bastennes pitch 10, mutton “ fat 10, oil of schistus 4, smoke black 1, amber earth 3, “ litharge 2, and alum 2 parts.” The litharge is mixed with the fatty oils and resins when melted together after which, when the liquid is nearly boiling, are added successively the alum, amber earth, and smoke black, the whole being well stirred.

The artificial leather so made is claimed as useful for carriage builders’ purposes.

[*Printed, 4d. No Drawings.*]

A.D. 1855, May 14.—No. 1,092.

GARRATT, ALFRED CHARLES.—Lubricating axles. The inventor says “ my invention consists of inserting into the “ hub or nave of a carriage wheel a tube, which I cause to “ extend nearly or quite down to the journal. This tube is “ provided with an enlarged mouth having a female screw. “ Into this tube I insert a round plug of metal, which I cause “ to extend down or nearly down to the journal. Within this “ plug I bore or make in the direction of its axis a chamber, “ and I also cut away the plug on one side so as to form an “ opening out of the said chamber. The plug so made is to “ be provided with a male screw adapted to screw into the “ female screw in the mouth of the tube, herein-before mentioned. By extending the plug entirely, down through the “ hub and to the journal of an axle, and providing it with a “ chamber, as above described, I am enabled to accomplish a “ very important advantage in the removal of wheel grease, “ and to keep the socket tube into which the plug is inserted “ always open and clear for the passage of oil into the hub of “ a wheel. When a plug is made with a chamber within it, “ and a cavity or passage opening through one side of it, “ wheel grease collects within the said chamber, and may be “ drawn out of it with the screw plug, from which it may be “ readily removed through the opening.”

[*Printed, 5d. Drawing.*]

A.D. 1855, May 15.—No. 1096.

CHRISTIE, PETER.—Portable hut for soldiers, &c. This invention relates to the construction of a hut or tent for the use of soldiers, emigrants and others. The inventor describes it as being carried in a waggon, a drawing of which he shows, but does not describe. It appears to be a closed four-wheeled van, having the fore wheels and fore carriage let in under the body, which is recessed for the purpose. This van may be used to form one side of a tent stable for the horse, the cover being attached to the roof at one edge and to poles at the other. The side opposite the van and the ends are supplied by canvas sheets.

[*Printed, 8d. Drawings.*]

A.D. 1855, May 16.—No. 1108.

VEZEY, ROBERT, and VEZEY, EDMUND.—Carriage steps.

“These improvements consist in a novel arrangement of mechanism or apparatus to be operated upon by the opening and closing of the carriage door, (as heretofore occasionally practised), for the purpose of opening and closing the step, or in other words, for exposing the step when required for use, and for concealing the step when out of use, and placing it out of the way of violence and dirt, and thus dispensing with the necessity for a step cover. The means which” are employed “for effecting the same are as follows:—” Into the socket of a cast-iron frame a spindle is placed, to which the carriage step is securely fixed. This spindle has three movements imparted to it, to enable it to descend and turn outwards by the opening of the door, and to ascend and turn inwards by the closing of the door; for which purpose there is a slide attached to the top of the above-mentioned spindle, which works in an inclined groove formed in the cast-iron frame; to said slide one end or arm of a bell-crank lever is connected by a link, and the other arm of said lever is connected by a rod to a hinged piece fixed to the door of the carriage. The opening of the said door depresses the bell crank lever and spindle to which the step is affixed, and simultaneously with this movement the slide on the spindle as it descends along the inclined groove will impart to the spindle a rotary movement, and thus cause the step to turn outwards and present and hold the

“ step firm for use; and the closing of the carriage door, raising the bell crank lever and spindle, will cause the step to turn inwards under the body of the carriage out of sight; and it is this novel and peculiar combined reciprocating and circular movement of the step, in combination with the movement of the carriage door, which constitutes this invention.”

[*Printed, 7d. Drawing.*]

A.D. 1855, May 16.—No. 1112.

RYE, WHARTON.—Iron wheel.

This wheel is primarily intended for railway purposes, but it “ may also be employed for other similar purposes.”

The “ improved wheel is formed or composed of two or more wrought-iron plates, a circular piece being taken out of the centre, and their sides hollowed or dished out from their periphery toward the centre, their convex surfaces being placed together, or, as it were, opposed to each other back to back, and then the rim of the wheel and the boss or nave of the wheel cast upon or around the wrought-iron plates, thus combining the whole together, the rim being ‘ chilled ’ in the casting, and the nave merely requiring boring out and finishing.”

[*Printed, 8d. Drawing.*]

A.D. 1855, May 29.—No. 1232.

JOHNSON, JOHN HENRY.—(*A communication from Jackson Brothers, Petin, Gaudet & Co.*)—(*Provisional protection only.*)—Casting wheel tires and rims. For this purpose centrifugal force is employed. The circular chill or mould is fitted on a shaft and while containing the molten metal is rotated at a high velocity. The metal is thrown to the edge and when sufficiently cool the top plate or rim is removed and the casting extracted.

[*Printed, 3d. No Drawings.*]

A.D. 1855, June 6.—No. 1295.

NUNN, HENRY.—Carriages for invalids and children, and fore carriage of vehicles. This invention relates chiefly to the

construction of a carriage for invalids and children, which may be folded up for portability when not in use. It is thus described by the inventor:—"I construct the main body of the carriage of two curved metal frames, which I joint together and shape so that they may fold the one within the other. The arms and back of the carriage I form of a third frame, which I joint to the hind frame in such a manner that it will fold down within the hind frame, and secure it in position by means of a spring catch or catches. When a double seat is required, a folding back may be applied to the forward part of the carriage. I propose to mount this folding carriage upon two pairs of wheels, to the front pair of which I apply a peculiar construction of guiding apparatus. Connected to the front corners of the carriage frame are two forked or slotted arms, between the forks of which the fore wheels are respectively mounted. These two levers are connected together at their inner ends by a cross bar, which at about the middle of its length is secured by a suitable spring to a cross bar in its rear, which bar forms the fulcrum for the fore and hind frames to turn on when the carriage is to be folded up. This spring will give the fore wheels a tendency to run in a line parallel with the sides of the carriage; but when the carriage is guided to the right or left the spring will yield, and allow the wheels to take the required direction; the spring will then act upon the carriage body, and draw it into a line with the diverging wheels. The like arrangement, with a slight and obvious modification, may be employed when only one steering wheel is used. I also propose to apply this 'locking apparatus,' as it may be termed, to four-wheel carriages drawn by horses; and in that case I connect the shafts by means of a vibrating slotted arm to the front bar of the carriage frame. This arm has its fulcrum on the front bar, and a pin on the cross bar that connects together the two forked levers (as before mentioned), plays in the slot of the arm, and transmits the lateral motion of the shafts to the fore wheels. When a traction or guiding handle is applied to the carriages of children and invalids, I employ the like arrangement of slotted arm."

[*Printed, 7d. Drawing.*]



A.D. 1855, June 20.—No. 1417.

FABIEN, JEAN FRANÇOIS VICTOR. — (*A communication.*) — Manufacturing wheels. This invention relates to “a novel construction of machinery for manufacturing wrought-iron wheels, wherein the combined action of an ascending die and pressing rollers is employed. The die, which is formed of the counterpart of one side of the wheel to be manufactured, is mounted on a suitable bed which slides in vertical guides, and by means of an hydraulic press or other means is forced upwards to impart the requisite pressure to the mass of heated metal which is placed in the die. Above this table is a strong frame which is mounted on a central axle and carries two sets of shaping rollers. These rollers press upon the upper side of the mass of metal and against the periphery thereof, as the rise of the table brings the heated metal in contact therewith, and by the rotation of these rollers the heated metal is forced down into the die, and pressed out until it fills the cavities therein and takes the shape of the die. When the wheel (supposing it to be a railway wheel) is thus formed, it is removed from the die, and a tyre is shrunk upon its periphery.”

[*Printed, 6d. Drawing.*]

A.D. 1855, June 28.—No. 1479.

SKELLEY, JOHN.—Wheels. The patentee says: “my invention of improvements in the construction of wheels, in the first part, consists in forming carriage wheels with an inner circle of felloes, placed at a distance from the hub to form an intermediate circle, whereby I am enabled to have a great number of spokes in the wheel, only some of which are carried into the hub or nave, the others sustaining the outer rim or felloes from the inner circle of felloes. In constructing these wheels, I mortise half the number of spokes into the hub, which spokes sustain the felloes or outer rim in the ordinary manner. Between these spokes I fit the inner felloes, at a distance (of some eight or ten inches) from the hub, so as to be flush with the sides of the spokes; they are forced hard up towards the centre, and held in position by rings or bands of iron, one on either side of the wheel; these inner felloes form a centre or hub

“ for the spokes intermediate of the main spokes, to which  
 “ centre they are fitted. The outer felloes or rim may  
 “ thus have a great number of points of support without  
 “ the necessity of using a large hub or nave to receive such  
 “ number of spokes ; moreover any side strain on the tyre is  
 “ distributed by the inner ring to several of the main spokes,  
 “ and prevents excess of strain on any individual spoke at the  
 “ nave.

“ The second part of my invention consists in the applica-  
 “ tion of an extending tennon or nose-piece to the points of  
 “ the spokes of a wheel, whereby the felloes or rim may be  
 “ caused to expand, and bear hard against the tyre. This  
 “ consists simply of a metal socket to receive the point of the  
 “ spoke ; it has a pin or tennon which enters the felloe ; this  
 “ pin is fitted with a screw and nut, which nut comes between  
 “ the felloe and the socket. The nut when turned round  
 “ presses the felloe outwards from the centre and against the  
 “ tyre. The tyre on the inner side is made concave in the  
 “ direction of its breadth, and is thereby prevented from  
 “ slipping sideways. The extending tenons force the felloes or  
 “ rim into the concave form of the tyre, the felloes or rim  
 “ being slightly convex to fit therein.”

[*Printed, 7d. Drawing.*]

A.D. 1855, July 4.—No. 1500.

GUILLAUME, GEORGE.—Driving carriages by hand or foot.  
 The improvement consists “ in what may be termed a one-  
 “ way crank or lever, and is composed of a double or single  
 “ arm, with or without balance weight, fitted loosely to the  
 “ axle or stock of the wheel at one end, and provided with a  
 “ spring and catch. A ratchet wheel or cogs to be fixed  
 “ either to the wheel or axle, into which the catch will drop ;  
 “ the crank or arm thereby (or by other means) having the  
 “ power to turn freely back, but not forward ; the crank or  
 “ arm to be worked by means of two or more rods, and a  
 “ roller fitted thereto or otherwise by a polished surface at the  
 “ end of the rods. A means of increasing or diminishing the  
 “ power is provided by extending or diminishing the point of  
 “ contact with the lever or one-way crank. The axle by this  
 “ arrangement may be straight instead of bent, as for the  
 “ ordinary crank. The loss of power experienced in the use

“ of the common crank until it has attained a certain angle  
 “ will be avoided. The greatest power will be at the points  
 “ where the ordinary crank is the weakest.

“ The facilities afforded by this improvement for propelling  
 “ carriages by hand or foot are as follows:—

“ Firstly, the means of propelling either the axle or wheel,  
 “ by which carriages may be easily turned.

“ Secondly, the strokes are not necessarily all of one length.

“ Thirdly, the weight of the person propelling and part of  
 “ the weight of the carriage, being thrown before the axle,  
 “ the propelling power is materially assisted.”

[Printed, 7d. Drawing.]

A.D. 1855, July 10.—No. 1541.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—Securing wheels upon axles. This invention consists in the following arrangement for the above purpose:—“ A circular  
 “ cap is fitted loosely on the arm of an axle adjoining the  
 “ shoulder, and is secured in its place by a collar, the inner  
 “ surface of the cap being provided at its edge with a number  
 “ of curved keys projecting inwards or towards the centre.  
 “ A corresponding number of segmental projections is attached  
 “ on the back end of the nave or hub. The edges of these  
 “ projections are ‘ creased ’ or grooved and also bevilled longi-  
 “ tudinally, and the inner sides of the keys on the cap are  
 “ bevilled to correspond inversely with the grooves in the  
 “ outer edges of the projections on the nave, and the edges  
 “ of the keys are inclined to correspond with the outer edges  
 “ of the projections. A pin is inserted in the back end of the  
 “ nave, the inner end of which bears against a spiral spring,  
 “ a hole being made through the cap to receive the pin. The  
 “ front end of the nave or hub is covered permanently  
 “ by a plate, and a band is attached to the back end of its  
 “ periphery.

“ To attach the hub or nave to the axle, the cap is placed  
 “ against the back end of the hub, the keys on the cap enter-  
 “ ing between the projections on the nave. The cap is then  
 “ turned from left to right, and the keys pass over the outer  
 “ edges of the projections, while the pin will pass into the  
 “ hole made to receive it in the cap, and so prevent the keys  
 “ from returning off from the projections when the vehicle is

“ moved backward. To detach the wheel from the axle, the  
 “ pin is forced back free from the cap by means of a suitable  
 “ key, when the cap can then be turned back, and the keys  
 “ will no longer hold in the recessed parts of the projections  
 “ on the nave.”

[*Printed, 7d. Drawings.*]

A.D. 1855, July 11.—No. 1546.

JOHNSON, JOHN HENRY.—(*A communication from Pierre Joseph Bertrand Geoffroy.*)—(*Provisional protection only.*)—  
 “ Improvements in the permanent way of railways, and in  
 “ carriages to be used in connection therewith or on common  
 “ roads.”

After describing his improvements in permanent way, the inventor proceeds to add as follows:—“ The improved wheels  
 “ consist of a species of broad double tyre, that is, although  
 “ the tyre is made in one piece, yet one portion is of slightly  
 “ larger diameter than the other; the larger diameter or  
 “ flange being made sufficiently broad for running on com-  
 “ mon roads, whilst the small portion or diameter of the  
 “ wheel is adapted to run on the rails of the permanent way.  
 “ The wheels are also constructed to be made either fast or  
 “ loose on their axles, according as the vehicle is intending for  
 “ running on a railway or on a common road. This is effected  
 “ by a suitable clutch and pin or key passed through the  
 “ axle, the arms of the clutch being made to enter between  
 “ the spokes of the wheel, which will then be in gear with  
 “ it and fast on the axle; but in order to release the wheel  
 “ the clutch is reversed, the arms or pins being turned from  
 “ the wheel, whereupon the wheel will be free to rotate on its  
 “ axle.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, July 12.—No. 1562.

CALDOW, JAMES, and MCKINNEL, JAMES BAINDEN AFFLECK.  
 — Turnip-cutting cart. This invention relates to “ an ar-  
 “ rangement of ‘ turnip-cutting cart,’ or apparatus for cutting  
 “ or slicing turnips and other vegetables during the actual  
 “ traverse or motion of the cart over the ground. In its  
 “ general external form and arrangement the cart or locomo-

“ tive cutter resembles an ordinary box form cart ; on a single  
“ pair of running wheels, and drawn by one horse. The  
“ body or chest portion of the cart is divided into two sec-  
“ tions. The upper one contains the uncut vegetables, whilst  
“ the lower one, formed by adding a secondary bottom,  
“ answers as the receptacle for the vegetables when cut.  
“ The actual cutting apparatus consists of two rotating cylin-  
“ ders with knives or cutters arranged in the manner well  
“ known to practical men as the ‘ Banbury turnip cutter,’ the  
“ cutting cylinders being actuated through the agency of  
“ gearing, or otherwise connected with the nave or some  
“ other part of one of the running wheels. As the cutting  
“ cylinders rotate in the upper section of the cart or under its  
“ floor, and sever the vegetables deposited therein, the severed  
“ pieces descend from the first or upper cart bottom to the  
“ second or lower bottom, where they are retained until  
“ required to be removed. The secondary bottom may con-  
“ veniently assume the form of a suspended platform, provi-  
“ sion being made for it to swivel upon centres to permit  
“ the cut vegetables to drop upon the ground even as the cart  
“ proceeds.”

[*Printed, 5d. Drawing.*]

A.D. 1855, July 16.—No. 1595.

NEWMAN, JAMES, and WHITTLE, WILLIAM.—Axles. The first part of this improvement relates to the manufacture of hollow axles with one or more diametrical bars or supports running longitudinally through them. These may be made of different sections. They are made by rolling skelps of required shape, for instance, strips having the projecting ribs thereon, the ribs meeting and forming a cross, and the joints being welded, and the journal is subsequently formed by rolling. For square common road axles, the supports or ribs are shown as diagonally placed from corner to corner.

The second part relates to the construction of solid axles after the same manner, the hollow parts being simply filled in with properly shaped iron filling pieces, and the whole welded.

[*Printed, 10d. Drawings.*]

A.D. 1855, July 20.—No. 1643.

JOHNSON, JOHN HENRY.—(*A communication from Edmond Roy.*)—(*Provisional protection only.*)—Axles. This improvement applies to both railway and common road purposes and consists in providing for the separate rotation of each wheel though fixed in the axle. The axle is made in halves coupled at the middle, so that each half may rotate independently of the other. The coupling is effected in various ways, chiefly by means of shoulders and collars, screw couplings, one half fitting in the other, a central bearing, and so forth. The two halves may also be bored out and have a mandril inserted therein for the purpose of tightening up the halves.

[*Printed, 3d. No Drawings.*]

A.D. 1855, July 21.—No. 1653.

MYERS, EDWARD. — Springs. This invention consists in arranging a number of spiral springs in a box, each spring being contained in a separate and concentric chamber. The bearing rod passes through the centre and has projections or shoulders upon it which come successively into contact with the springs according to the power to be applied.

[*Printed, 8d. Drawing.*]

A.D. 1855, July 21.—No. 1657.

WREN, JOHN WALTER CAWLEY. — Folding perambulators. The main frame is of iron mounted on wheels easily removable. To this frame is jointed the back frame, supported in position by struts on the axle of the hind wheels. When released from the struts, the back frame may be laid flat on the main frame. The propelling handle is jointed on the back frame, and is held in position by binding screws. The arms are also jointed to the back frame. The forward end is supported on the fore frame which folds back on the main frame. The seat is of sacking suspended from bars with which the fore and hind frames are provided. The foot board folds down on the main frame. For facility of removal, each wheel is mounted on a short tube and is free to rotate thereon. This tube fits on the fixed axle like a sleeve and is held thereon by a moveable pin.

[*Printed, 8d. Drawing.*]

A.D. 1855, July 23.—No. 1663.

GOODYEAR, CHARLES.—(*Provisional protection only.*)—India rubber wheels. These wheels are to be made of hard vulcanised india-rubber. “Each wheel is made in two parts, “ which are fixed together by means of screws and nuts, and “ when the wheels are desired to move without noise vul- “ canised india-rubber is shut in between the two parts, by “ which the surface which comes in contact with the road is “ elastic.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, July 24.—No. 1686.

GOODYEAR, CHARLES.—(*Provisional protection only.*)—India-rubber carriage bodies. Sheets of vulcanized india-rubber, before being made hard by heat, are built up into the required form, after which the body is subjected to heat to produce change in the india-rubber compound. Such material before heat is applied, may be combined with fabrics, with cloth and other substances.

[*Printed, 3d. No Drawings.*]

A.D. 1855, July 26.—No. 1695.

BEATTIE, JAMES.—Ambulance. This invention relates to the construction of a mattress which may be used for a variety of purposes. This mattress is made with sides and ends to fold upwards and so make a box shaped structure. It is covered with waterproof material and may serve as a boat. To convert it to ambulance purposes, it is when folded as above hung from upright stanchions fitted into a horizontal frame supported on two wheels by springs. The stanchions also serve to carry an awning or tilt. If extreme ease of motion be not required, the mattress may rest on the framing itself.

[*Printed, 9d. Drawings.*]

A.D. 1855, July 27.—No. 1706.

ALLEN, WILLIAM.—“Vehicle for the transport of camp “ baggage.”

The vehicle consists of two wheels united by a hoop or tire. The felloes and spokes are of angle iron. The nave is in two

parts, cut transversely to facilitate insertion of the spokes. The wheels are joined together to form one, a band of sheet iron being connected with the flanges of the felloes. The baggage is carried in the space between the two wheels. An axle is passed through the centre and properly secured to afford hold for the draught. When taken to pieces the spokes, with the felloes at their ends, are placed upright in the ground and canvas stretched over them. Thus shelter may be afforded for a number of men.

[*Printed, 7d. Drawing.*]

A.D. 1855, July 28.—No. 1716.

ABRAHAM, HENRY ROBERT.—(*Provisional protection only.*)—Two wheeled carriages “to be called a rotalta.” The following is the provisional specification:—“An arrangement and  
“ adjustment of the body of the carriage, its seats, and springs  
“ which admit of their being carried on one axle with ease and  
“ security, the seats on the roof being nearly perpendicularly  
“ over the axle across the carriage in a line with the axle,  
“ thus balancing or regulating the weight in reference to the  
“ draught, and rendering it easy. The wheels, as the name  
“ of the carriage implies, are high; the axle is better cranked  
“ or bent, so that the step into the carriage is easy, and the  
“ centre of gravity brought low.” The inventor purposes  
“ strong side and back under springs. When fitted for an  
“ invalid carriage, the shelves on which the patient reposes  
“ run on friction rollers, and have eyes to receive bearing  
“ poles.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, August 9.—No. 1803.

WEBSTER, ALONZO.—(*Partly a communication from Harvey Webster.*)—Disengaging horses. This relates to an improved method of attaching the traces to the whiffletree. At each end of the latter is a stud on which the eyes of the traces are hooked. A spring bolt is also arranged at each end, which, when the spring is allowed to act, pushes the eye of the trace off its stud. The spring is, however, restrained by a catch, which at the proper time is released by a cord from the carriage.



The breeching is placed over a hook and is held by a spring in such a way that on a forward pull only it is released.

[*Printed, 6d. Drawing.*]

A.D. 1855, August 27.—No. 1938.

SMITH, JAMES.—Perambulators and invalid carriages. The inventor claims as his improvement the construction of such carriages of “sheet metal, perforated or plain,” instead of wood. The “upholstery or padding” is fastened to wood which is secured by screws or nails to the parts of the carriage.

[*Printed, 3d. No Drawings.*]

A.D. 1855, September 7.—No. 2028.

DAMERON, LOUIS.—“Improvements in the construction of “carriages.”

The specification describes a landau capable of being converted from two to four seats and of being easily thrown open. The front part is moveable, and another part is substituted which increases the space and permits four seats to be available. The upper part and door tops may be taken away when the back part or hood may be let down to open the vehicle. “Covering joint hooks” are used to keep out rain, and the patentee applies “above and underneath the framework “lathes, bars with cramp irons, which prevent the body from “pressing, and renders the adjustment more perfect.”

[*Printed, 7d. Drawings.*]

A.D. 1855, September 8.—No. 2038.

DURANT, ANGUISH HONOUR AUGUSTUS.—Indicating number of passengers. For this purpose a pointer is used which is acted upon by “a spiral spring, tending to force it outwards, “so that when it has made one revolution in a circular groove “on the dial, it is forced outwards and caused to enter another “circular groove, around which it passes step by step as “passengers enter, or distances are told till the pointer “arrives at the end of such second groove, when the pointer “is again forced outwards, and enters a third groove. And “in order to ascertain more particularly how far passengers “have travelled, the seats are hinged, and by springs and

“ levers are held up, by which the counting instruments are kept out of action so long as there are no passengers.” In order that time also may be indicated, “ a time keeper and a second hand on a similar principle may be combined with the apparatus on the same dial if necessary.”

[*Printed, 7d. Drawing.*]

A.D. 1855, September 12.—No. 2061.

MACINTOSH, JOHN.—Springs. This invention relates to an air spring. The patentee prepares “ membranous tissue or skins in glycerine, or in glycerine and gelatine mixed with water, so as to render them pliable and impervious to air.” This skin or tissue is then “ formed into a bag, and put into a cylinder; a plunger is then inserted into the cylinder, and made to act upon the bag.”

[*Printed, 5d. Drawing.*]

A.D. 1855, September 14.—No. 2078.

STOCKEN, FREDERICK.—(*Provisional protection only.*)—Springs. This spring “ is composed of two bent or cranked springs, connected together at the bends by coupling plates. Two ends of the cranked or bent springs are attached to a half elliptic spring, and the other two ends ” are attached “ or linked to a bent bar by a brace, or it may be to a spring.”

[*Printed, 3d. No drawings.*]

A.D. 1855, September 17.—No. 2093.

SCOTT, URIAH.—(*Provisional protection only.*)—Improvements in carriages. These improvements are directed to the reduction of vibration for which purpose felt is used. Instead of using four wheels, a single wheel may be substituted for the two in front. This wheel is carried by an axle equal to the diameter of the wheel. The springs are semicircular instead of straight. They are secured at their ends “ by a metallic cap or socket, similar in shape to the letter V, and ‘ set ’ by having a block or cushion ” in the angles. The springs are placed between the turnplate and the body to neutralise the vibration of the turnplate. The latter consists of two circular plates held by side clips. In this carriage the driver’s seat is behind.

The axle is in two parts, the inner or main shaft being packed with felt. If, however, a solid axle is used, the surface is corrugated. This allows more hold for the lubricating matter, and any dirt or grit will sink into the hollows and not grind the bearings.

Metal felloes are secured by bolts to the spokes by caps or ferrules in the latter having projecting pieces like the letter T. Elastic material is inserted under the tire. The caps or ferrules may be applied to both extremities of the spokes.

The nave consists of a hollow socket packed round with felt held by a thin sheet of metal and forced into the wooden or metal hub.

The inventor then describes his "hind springs" which "will also do for the front. I make a straight or curved spring of steel for the bottom, I then bend two pieces of iron in the form of an arch, or any other suitable shape, with a joint in the centre and at the two ends. I then fasten my button spring to my arched tops with bolts. I then fix a band of leather or india-rubber, or other suitable material to the under side of the arch. I then take two pieces of iron, arched, or any other suitable shape, with two holes at the ends; I then bolt them to the bands of leather, so that they will be perfectly free from all metallic connection with the steel spring and the arched top first mentioned. In some cases I place bands of leather below the steel spring. When I do that I do not require the arched irons first described, but the second ones only to be fastened to the bands, as before mentioned."

[*Printed, 3d. No Drawings.*]

A.D. 1855, September 18.—No. 2108.

SMITH, FERIDOON HANKEY.—Brake for carriages with poles. This brake is to be worked by the action of the horses when pulled up. A lever is fitted to the end of the pole. One end is secured to the pole chains or straps, the other to a rod extending behind the front or back wheels and carrying the brake bar. On the pole chains being drawn back, the brake bar is drawn forward. A spring is provided to take off the brake when the strain on the pole chains is relieved.

[*Printed, 6d. Drawing.*]

A.D. 1855, October 8.—No. 2245.

JOHNSON, JOHN HENRY.—(*A communication from Jackson Brothers, Petin, Gaudet, & Co.*)—Rolling tires. This invention which is described as “more particularly applicable to the “ manufacture of the tires of railway wheels ” consists in an arrangement of machinery for rolling out tires. For this purpose a pair of rolls is used. The lower one is fixed and rolls the outside, the other is capable of adjustment vertically by a screw. Each has a collar for regulating the width. Two sets of the above rolls are used, one for roughing, the other for finishing, the collars being reversed on the rolls respectively. By this arrangement only a vertical pressure is applied, but by another the rolls may be made to give a lateral squeeze so that the enlargement of the tire may take place, not only at the expense of the thickness but also of its width. For this purpose, the upper roll is shaped as a rectangular **V** in section and the tire is placed at an angle when being rolled. The upper roll acts on one edge and the inner part of the tire, the lower roll working on the outside and other edge.

[*Printed, 11d. Drawing.*]

A.D. 1855, October 11.—No. 2270.

REINAGLE, RAMSAY RICHARD.—(*Provisional protection only.*)—Barrows, hand trucks, and other similar vehicles.

These improvements consist “in so constructing barrows “ and other similar vehicles, as to allow of heavy weights or “ loads being more easily transported by them than by the “ ordinary barrows and other similar vehicles now in use ; “ and this is effected by inclining the front and sides of the “ vehicles to a centre, to meet in the centre of the axle of the “ wheels, by placing the axle of the wheels to the rear of the “ centre of the floor of the barrow or other similar vehicles, and “ by extending the arms of said vehicles considerably beyond “ the length of those barrows and such like vehicles now in “ use. The wheels are barrelled together, and the barrels “ varied in diameter to meet the necessities of different “ surfaces over which it may be required to travel.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, October 13.—No. 2288.

COCKINGS, JAMES SEPTIMUS, and POTTS, FERDINAND.—Whip sockets and lamp irons. This invention consists in applying to the interior or to the mouths of metal or leather whip sockets, rings or perforated discs of gutta percha for the purpose of steadying therein the whip handles. These rings or similar articles may be of different shapes. They are generally secured to the socket by means of rings or clips of thin metal turned down upon them so as to compress their edges between such clips or rings and a rib or ring on the socket. For leather sockets a moulding apparatus is used. The metal cap at the bottom of the socket is similarly secured, and it may be lined with gutta percha. The improvements also relate to a trade mark and a method of attaching it to the sockets by means of bands of metal.

A similar arrangement is applied to lamp-irons for the purpose of securely holding the lamp and of preventing vibration.

[*Printed, 11d. Drawing.*]

A.D. 1855, October 13.—No. 2293.

ULLRICH, LOUIS.—(*Provisional protection only.*)—Indicating number of passengers entering an omnibus or other carriage. “ These improvements consist in the use and employment  
“ of certain mechanism so disposed or placed as that a portion  
“ thereof shall be acted upon by the feet of persons entering  
“ an omnibus, theatre, or other building; to ensure which,  
“ this part of the mechanism (if, for example, the appa-  
“ ratus is required to be used at a theatre or other similar  
“ public building,) should be placed at the pay place of such  
“ a building, at which only one person can pass at a time.  
“ The nature of these improvements will, however, be better  
“ understood by the following description of the means by  
“ which they may be effected, that is to say :—To the flooring  
“ of the building, or other place to which the apparatus is to  
“ be applied, a bell-crank lever is connected, and has liberty  
“ of vibratory movement; the horizontal arm of such said  
“ lever having a plate of metal or piece of hard wood affixed  
“ thereto, which comes flush or nearly so with the surface of  
“ the flooring ground, or other part, when the apparatus is

“ out of use, and descends sufficiently when trodden upon to  
 “ impart the necessary movement to a train of wheelwork, to  
 “ which the vertical arm of the aforesaid lever is connected.  
 “ Upon the principal axes of this wheelwork hands are placed,  
 “ the outer extremities whereof point to figures marked upon  
 “ a dial or face plate in connection therewith; the long hand  
 “ moves from one division to the next at each vibration of the  
 “ aforesaid lever, and this registers one person at each move-  
 “ ment of the lever as it is pressed upon the face of the dial  
 “ near the periphery thereof, being divided into 100 equal  
 “ parts. Each entire revolution of the long hand will there-  
 “ fore only register 100 persons, which number is now  
 “ transferred to and registered by the short hand on the  
 “ centre part of the dial, which is divided into ten equal parts,  
 “ the wheelwork being so constructed as to cause the afore-  
 “ said short hand to move only from one division or mark to  
 “ that next to it for one entire revolution of the long hand,  
 “ thus enabling this apparatus to register 1,000 persons.”

*[Printed, 3d. No Drawings.]*

A.D. 1855, October 17.—No. 2318.

CLEMENT, JULES HYPOLITE.—Brake for carriages.—The first part of the invention appears to consist in mounting a brake block at one end of an arm or lever the other end of which is connected to a spring, the brake block when out of action being raised above the centre or axis of the wheel, and the arm or lever being in an inclined position, the result of this being that on allowing the brake block to fall into contact with the wheel the motion of the latter forces it downwards until the arm or lever to which it is connected is brought into a horizontal position, causing it to thrust against and bend the spring, the reaction of which again causes the brake block to be pressed forcibly against the wheel.

This, in fact, appears to be the leading feature of the invention, but in connection with this are described a multitude of details embracing “ rods running the whole length of the “ train ” for the purpose of bringing the brakes into action ; modes of lengthening and shortening the arms or levers which carry the brake blocks ; “ freeing or disengaging the “ train by the reaction of the springs which serve to stop it ; ”

and numerous arrangements of springs, levers, clutches, tappets, guides, rods, screws, links, eccentrics, tumblers, slides, universal and other joints and other mechanism of which no clear idea can be formed without an examination of the drawings annexed to the specification. The last part of the invention is defined as consisting in “the use of triple joints, either “isolated or resting one on the other, to counterbalance a “great power by a very small one before disengaging the “springs, and to obtain this result by suspending the breaks, “the back one a little above the axis of the wheel, and the main “front one a little below it.” The patentee states the invention to be applicable to common vehicles on ordinary roads as well as to railway carriages, and that it may also be applied to brakes for other purposes.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1855. October 17.—No. 2320.

THOMSON, WILLIAM.—(*Provisional protection only.*)—“Improvements in four wheeled carriages.”

This invention relates “to a ‘four-wheeled sleigh dog cart,’ the object being the so arranging the vehicle that it can be used either as a four-wheeled dog-cart, or as a sleigh, or sledge-bottomed carriage for running over snow and ice. The body of the vehicle is double seated, with a central back, after the manner of an ordinary dog cart, the pattern and general contour and form being alike on each side of the transverse centre. This body, when disposed upon two small front and two larger hind wheels, forms a very elegant carriage, of extreme lightness. It is fitted up with aprons and mountings for both back and front seats in exact correspondence, and it is so contrived behind that ladies may step in and out of it without bringing their dresses into contact with the wheels. The body may be made either with or without a curve for the locking of the front wheels beneath. When the body is detached from the wheels and their appurtenances, and placed upright on the ground, it forms a complete double-seated sleigh both back and front, at the bottom being curved upwards and shaped sleigh fashion. By this system of construction a very elegant vehicle is secured, whilst it answers for two distinct uses or purposes.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, October 19.—No. 2341.

SMITH, JOHN.—Springs for bedsteads, &c. This invention consists in the application of laths or strips of lancewood to bedsteads and other articles in place of metal springs. The ends of these laths may rest in elastic slings; and to secure uniformity of motion, they may be placed upon a sheet of ticking. The use of these laths is claimed for carriages, litters, ambulances, &c. They are also shown as placed between two railway carriages, somewhat as side couplings for the purpose of steadying them.

[*Printed, 9d. Drawings.*]

A.D. 1855, October 22.—No. 2361.

LENNY, CHARLES.—Carriages. This carriage has a “light, “ open, framework body provided with sides or wings extending over and above the ‘wheels’ in an arched or shell-like “ form, the axles being secured through the intervention of “ double C springs to the underneath fixings of the seat in “ such manner as to work freely within the centre of the “ open frame of the said body.” The draught is applied to the framing below the axle, and the latter is attached to the springs by means of links. The passengers should preferably sit back to back in pairs.

[*Printed, 5d. Drawing.*]

A.D. 1855, October 27.—No. 2402.

GEYELIN, GEORGE.—(*Provisional protection only.*)—Perambulator. The inventor says “this invention relates to a “ mode of constructing perambulators that will admit of their “ being brought into use in the nursery when not required “ for out of door service. This object I attain by mounting “ the body of the carriage (whether the body be single or “ double) on a pair of rockers, and fitting wheels thereto by “ means of clamps or other analogous contrivance which will “ permit of the ready application and removal of the wheels “ and axles. The propelling handle I also connect temporarily to the body of the carriage. When the wheels are “ removed, the perambulator will be converted into a rocking chair; and when provided with a double body, it may “ be employed as a substitute for a rocking horse.”

[*Printed, 3d. No Drawings.*]



A.D. 1855, October 27.—No. 2406.

SPEED, JOHN JAMES, junior.—Springs. The invention consists in the use of “corrugated conical or dish-shaped metallic plates for car or carriage springs, which plates are placed together in pairs or sets, one set or pair resting upon the other. These conical or dish-shaped plates should be made of steel of a suitable thickness, regard being had to the vehicle for which they are intended. Each plate is corrugated in a radial manner, and the number of such corrugations may vary as wished. The corrugations should, however, be regular, or the prominences should correspond with the depressions, so that the periphery of each plate will form a regular wave line. These plates are placed together in pairs, the edges of each pair being in contact, and the prominences of one plate fitting into the depressions of the other, forming a chamber or space between each pair to allow for the necessary depression or contraction of them. The number of pairs of plates used may be increased or diminished, as found necessary. Or, in cases where elasticity is more desirable, as in light carriages, or city railroad cars, the plates may be placed in contact, the depressions at the edges touching; this arrangement will, however, be at the sacrifice of strength to a certain extent to greater elasticity. When it is desirable to increase the strength of the plates it may be done by using smaller auxiliary ones, and exactly or nearly fitting within the others, so that each set will in fact consist of four, or of any equal number of plates. These plates are generally placed upon a pin or bolt passing through their centres, the lower end being attached to the truck, and the upper end to the bolster of the cars.”

[*Printed, 7d. Drawing.*]

A.D. 1855, October 29.—No. 2411.

KENNARD, JOHN.—(*Provisional protection only.*)—Perambulators and invalid carriages. “This invention consists of making the bodies of such description of carriages of sheet metal stamped or pressed into dies, by which more elegant and varied devices may be obtained at less cost than when making the bodies of wood, as heretofore. In other respects the car-

“riages may be constructed as at present. And by preference  
 “each carriage ‘is made’ with three wheels, and the handle  
 “for moving a carriage ‘is applied,’ as is commonly the  
 “case, at the back.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, November 1.—No. 2434.

BEAUMONT, HENRY BARBER. — (*Provisional protection only.*)  
 — Emigrants and travellers’ cart and hut. The object of  
 these improvements is to provide a hut which shall when  
 not in use be capable of adjustment in another form as a cart  
 or waggon body “the sides, back and front of the hut will be  
 “formed of pieces of timber, placed one above the other, and  
 “held in position by supports external and internal facing  
 “each other the four corners of the hut being single supports  
 “four-sided, with grooves on two adjoining sides for the  
 “timber to fit in. The foot of each support will fall into a  
 “groove in a block fixed in the ground, and the top, as well  
 “as the portion of timber it embraces, will also be let into  
 “grooves in the ribs, connecting the pieces of timber of  
 “which the roof is formed, and these ribs will be fixed into  
 “a slanting groove in pieces of timber or other material  
 “forming the top of the roof, and will be connected and  
 “supported by cross pieces. The floor boards will also be  
 “let into grooves in a framework, so as to be fixed without  
 “nailing; provisions will, of course, be made for doorway  
 “windows and ventilation. The timbers forming the back,  
 “front and sides of the hut will form the top, bottom and  
 “sides of the boxes, being connected in grooves, and the  
 “pieces forming the roof will supply the back and front of  
 “boxes. The windows of the hut will, for the purpose of  
 “carriage, be fixed into one of these boxes, fitting into  
 “grooves. The corner supports of the hut will form the  
 “lower edges of the sides of carts or waggons, into the  
 “grooves of which some of the side timbers of the hut will be  
 “fitted, to form the sides and bottom of the vehicle, and the  
 “door may also be converted to the latter purpose, and  
 “some of the floor boards placed one above the other side-  
 “ways, and held together by a portion of the floor; frame-  
 “work may also be used to form the sides; and the back and

“ front may be formed of other pieces of timber, which at  
“ other times may be formed into tables and shelves in the  
“ hut.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, November 7.—No. 2501.

CRAIG, WILLIAM GRINDLEY.—(*Provisional protection only.*)—

“ Improvements in bearing, buffing, and draw springs, ap-  
“ plicable to the rolling stock of railway and other vehicles.”

This invention relates to a mode of applying “ what is  
“ technically called the sliding shoe to locomotive engines,  
“ tenders, carriages, waggons, or any kind of vehicles,  
“ whether used on railways or high roads,” and consists “ of  
“ connecting the two sliding shoes by shafts or tension rods,  
“ with a spring or elastic medium between them,” the shoes  
being also connected “ by diagonal rods or shafts to the axle  
“ boxes at one end, and the sliding shoes at the other for  
“ railway vehicles,” while in “ road vehicles” the sliding  
shoes are connected “ with the axletrees by means of diagonal  
“ rods, as before described, with tension rods, having an  
“ elastic medium between them.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, November 9.—No. 2520.

OLIVE, JOHN, and OLIVE, WILLIAM.—“ Iron wheels for  
“ railway and other purposes.”

These wheels are made in the following manner:—“ Two  
“ discs stamped concave, or with concentric or radiating  
“ corrugations, are placed upon a tube of the size required to  
“ form the nave of the wheel. A hoop of wrought iron to  
“ form the felloe of the wheel is placed between the outer  
“ circumference of the disc; the parts are then heated and  
“ welded together in a stamping press, or by other suitable  
“ means.”

The tire is shrunk on and then attached by screws, or by  
welding pieces of iron partly to the wheel and partly to the  
tire. In wheels of large dimensions the discs are connected  
by hoops in tubular stays.

[*Printed, 6d. Drawing.*]

A.D. 1855, November 12.—No. 2546.

JOHNSON, JOHN HENRY.—(*A communication from Jackson Brothers, Petin, Gaudet, and Company.*)—Constructing wheel tires.

This invention consists in casting tires by pouring the molten metal into a horizontal mould revolving at a high velocity. By this means a core is rendered unnecessary. The mould is supported on a shaft, either cast on it, or fitted into an internal boss. If the latter plan is adopted the sides of the boss are inclined so that the metal may run readily from the centre to the periphery. The face or top plate may be either a ring of sufficient width or a closed disc with a central funnel mouth.

[*Printed, 7d. Drawing.*]

A.D. 1855, November 29.—No. 2698.

NORTH, GEORGE.—Carriage heads, tilts, &c. Part of this invention relates to an arrangement of tilt or cover supported upon hoops or frames which slide by means of eyes, on horizontal bars fixed to the vehicle. These frames are also hinged so as to fold back when not required for use. Consequently, when the tilt is not wanted, the frames may be slid along the rods nearly to the end of the vehicle and then folded back, so as to throw open the vehicle.

Another part relates to a ratchet stop or catch for expanding hoods. The bottom part of the main frame is shaped as a ratchet, this engages with a spring catch fixed under it to the carriage. When the hood is to be lowered the catch is withdrawn from the ratchet by a thumb piece.

[*Printed, 10d. Drawings.*]

A.D. 1855, December 4.—No. 2723.

GARN, SAMUEL.—Tipping apparatus. This apparatus, says the patentee, “consists of an upright brace or sword drilled “with several holes to receive a stud or pin, and is secured “to the centre or front shoot of the shaft by a strong hinge “joint. To the frame of the fore part of the cart body is “attached a double or slotted staple, embracing the sword “and allowing it to slide through when tipping the cart. To

“ regulate the action of tipping, I bolt to a suitable staple in the front of the cart frame an horizontal lever, one end protruding at the cart side with a handle for operating it, and the other end passing behind the vertical brace or sword, and made to press against the back thereof by means of a strong spring. This end of the lever is furnished with a pin or stud which fits the several holes in the vertical sword piece, so that when tipping the cart the pin is pressed by the spring into each hole in succession, acting as a stop, and thereby the elevation of the cart body or other vehicle can be regulated to and retained at any required angle. At the side of the vehicle I place a long tipping lever, which is kept in its place and slides through staples fixed to the side framing; at the front of the vehicle this side lever is bolted to the front lever, which it serves to operate from behind the cart or other vehicle by means of a handle when required to be so used.”

[*Printed, 3d. No Drawings.*]

A.D. 1855, December 4.—No. 2724.

BRÉCHEUX, ETIENNE ANDRÉ NAPOLEON.—(*Provisional protection only.*)—Axletree. The invention consists in “inserting in or fitting to an axle a chain cable, bundle of wires, or a rod, which will support the axle in the event of breakage.” In the case of hollow axles the chain is fixed in two parts united at or about the centre of the axle by screws and a threaded collar, so as to keep the chain at a proper tension. “In order to get access readily to the collar” the axle, or part of it, is made “in two parts longitudinally,” the parts being united by bolts and nuts.

[*Printed, 3d. No Drawings.*]

A.D. 1855, December 7.—No. 2764.

LENNY, CHARLES.—“Improvements in carriages.”

The patentee says, “my invention consists, firstly, in constructing the bodies of carriages so as to form either open or close carriages without presenting as at present any unpleasant obstruction to the sight; to effect which object I cause the folding top to throw back in the usual manner, but to include with it the front portion also, so as to render

“ the opening or closing of the whole top of the said carriages  
“ one operation, whilst the side-front and centre pillars are  
“ rendered moveable by means of metallic hook hinges  
“ secured to the ends of the said pillars, the glasses or win-  
“ dows remaining in the doors or body of the carriages when  
“ employed as open ones.

“ My invention has reference, secondly, to an improved  
“ mode of giving motion to the steps of carriages (to be used  
“ in connection with my above improvements) through the  
“ intervention of the carriage doors, the opening or shutting  
“ of which causes the said steps to slide backwards or for-  
“ wards, the doors being provided with crank actions for that  
“ purpose. The advantages of the coupling of the carriage  
“ step with the door consist in the step being brought for-  
“ ward simultaneously with the opening of the door, and  
“ returning to its former position on the closing of the same,  
“ thereby avoiding the possibility of its being run against or  
“ splashed as at present.” The step works after the manner  
of one half of a parallel ruler, being suspended from the  
carriage body by two links.

[*Printed, 6d. Drawing.*]

A.D. 1855, December 11.—No. 2790.

HUGHES, BERNARD.—(*A communication.*)—Machine for making spokes, &c. The invention consists “ in the employment  
“ and adjustment of two rotating cutter heads placed upon a  
“ shaft fitted or attached to a frame having an up and down  
“ movement and allowing the cutter heads to move laterally  
“ upon their shaft. By this arrangement, the cutters or bits  
“ may be moved vertically and laterally while acting the  
“ material to be cut, which, placed upon a moveable frame  
“ operated by a feed motion, is reduced when brought in  
“ contact with the cutters to the desired shape.”

“ The cutter heads are placed on a hollow shaft having a  
“ driven pulley. Rods passing through the tube of this shaft,  
“ and revolving with it, are attached, one to each of the  
“ cutter heads. These rods are attached to rectangular  
“ levers pivotted to the side of the stationary frame. The  
“ other ends of these levers are kept in contact by springs,  
“ with guide plates or bars attached lengthwise to the side of

“ the feeling frame, and as these guides operate on these  
“ arms, depressing them more or less, according to their  
“ conformation, the cutters, by the forcing inwards of the  
“ rods by the levers, are brought laterally closer together.”

“ The frame on which the tubular shaft has its bearing is  
“ pivotted on one side to the stationary frame, leaving the  
“ other side subject to the action of another guide plate or  
“ bar, set lengthwise on the top of the feeding frame; accord-  
“ ing to the pressure of this guide plate, the arched frame is  
“ raised or lowered on that side, and with it the cutter  
“ heads.”

[*Printed, 7d. Drawing.*]

A.D. 1855, December 11.—No. 2793.

PRÉAUD, JEAN MARIE.—India rubber springs. The patentee claims under this “ invention ” the use of india-rubber, pure or “ blended with other substances, vulcanized or not ” in solid or hollow blocks or masses, “ with no angles, or no other but “ round or roundish forms,” for the purposes of springs. Numerous shapes are shown but no methods of their application are described as shown.

[*Printed, 6d. Drawing.*]

A.D. 1855, December 14.—No. 2825.

KRUPP, ALFRED.—Wheels. This invention consists, firstly, in forming the interior parts of railway and other wheels, together with their naves “ of one piece of solid wrought iron “ and without welding.” The patentee first forms, “ by “ forging and welding together several pieces or layers “ of iron, a lump or blank of sufficient diameter and thick- “ ness to yield the required disc and nave.” These lumps or blanks are then heated in a suitable furnace, and acted upon by a suitable hammer, so as to prepare them for a rolling process, the under side of the hammer, as well as the face of the anvil, being provided with holes corresponding with the size and form of the intended nave, and the blank or lump being turned during the process of hammering so as to prevent the metal from becoming fixed in the holes. “ The “ metal or blank then takes the form of a plate, having at or

“near its centre on each side a projecting lump, which corresponds to and forms the nave, when the disc is completed.”

A tire may be united with a disc, such as described above, either by a flange formed in the inside of the tyre, to which the disc is bolted or riveted, “or by a separate ring of angle iron bolted or riveted to the disc,” and the tire then shrunk or bolted thereon. The rolls may be of tapering, or of elliptical, or of a volute form, the disc being worked to and fro between them until brought to the desired size or shape, being then afterwards subjected to a hammering process or to hydraulic or other pressure if desirable, in order to “equalize the surface.” Discs may thus be formed which may be equal in thickness from the nave to the circumference, or thicker in one part than in another, or of a “corrugated” or undulated form, radiating from the nave to the outer “circumference of the disc;” and such discs may either be composed of iron or of steel, or of any other metal or combination of metals capable of being subjected to the process described. One modification of the invention is described in which the disc “gradually inclines from a vertical or other line taken through the diameter of the disc at the centre,” the interior parts of the disc being thus in fact of a “dished” form. The details of the invention are minutely described.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1855, December 19.—No. 2874.

ABRAHAM, HENRY ROBERT.—Two wheeled carriage. The carriage, which is supported by long side springs on two wheels, is divided into two compartments, the floor of that in front being very near the ground. The seats are as near the axletree as possible. The front compartment is entered from its side; the other from the rear. The roof seat is made moveable for the purpose of adjusting the load. Besides the roof seat for passengers, there is a box seat for the driver. Small wheels are fitted under the front part of the carriage to prevent concussion should the horse fall and to assist in keeping him on his feet if inclined to fall. Two horses may be used if preferred, a pole and splinter bar being, in that case, fitted to the carriage.



A modification of the carriage is shown for ambulance purposes. There is no front compartment; the inside being fitted with letters or stretchers for recumbent wounded. The entrance is from the rear, where there is also a system of folding shelves or boards, which may be used as a luggage tail or amputating table as desired. Near the front, on each side, is a broad step or platform from which the surgeon can attend to the occupants of the carriage, even while it is in motion. A water tank may be fitted under the carriage body. A hood or cover is attached to the rear, and there are perforated ventilators or shutters and blinds. The stretchers run on friction rollers, and rest on springs. They can be folded up when not in use. The due adjustment of the seats and weight is carefully secured.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1855, December 24.—No. 2910.

HOLDWAY, FREDERIC.—Springs, steps, &c. This invention relates firstly to certain methods of fitting springs. According to one method, the patentee uses a very long under spring which extends the whole length of the carriage body and to which the axletree is attached. The front end is attached to a scroll iron or to a cross spring; the rear end to a half elliptic or other suitable spring. Front springs may be made according to another method, that is by combining two elliptic springs. Each spring may be considered as having one of its ends, with the joint, cut off. The end of each bar or half spring is then attached by clips to the bar or half of the other spring, so that the two mutilated elliptic springs form one with double members.

The improved step consists of a metal frame fitted with wooden steps and sliding into a case under the carriage body. It is moved in and out by means of a bar or link attached to the door.

The ends of blind rollers are fitted firmly in their sockets, so as to prevent noisy vibration, by means of india-rubber, leather, felt, or other suitable packing.

The patentee also proposes to use, instead of silvered reflectors for carriage lamps, reflectors of "enamelled metal, with china, porcelain, or glass, with white material between two

“ glasses, or the porcelain or china without the combination of metals.”

[*Printed, 6d. Drawing.*]

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1856.

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A.D. 1856, January 1.—No. 2.

SWIFT, FERDINAND.—Wheels and axles, &c. The inventor says, “my improvement in wheels for vehicles consists in constructing them with a double set of spokes, somewhat similar to the ordinary tension wheels with one series of spokes, which at the hub or axle are placed at a distance from a second series, but both converging to the same plane at the tyre. I make wheels of this kind with the one series of spokes in the plane of the tyre or rim, throughout their whole length, or in other words, at right angles to the shaft, while the second series of spokes are sufficiently inclined to the first to form the necessary stay and support for the rim. I fix each wheel to its respective axletree, which I make in two pieces, and incline them in opposite directions, so that the rim or tyre and one series of spokes stand at an incline outwards, equal to the incline of the second series of spokes inwards. I mount each axle in two bearings fixed to the carriages, which bearings are bushed with brass or other proper metal surfaces, in order to produce little friction, and which can be removed or renewed at pleasure. In making these wheels and axles I form suitable enlargements on the axles for the reception of the screwed ends of the spokes, which may have countersunk heads in the tyre or rim, or may be fitted with countersunk nuts at those points fitting into proper recesses in the rim.” Each wheel is thus mounted on a separate axle which runs in bearings attached to the carriage in various ways. Sometimes these bearings take the form of a hollow axletree.

The inventor also proposes to cover the dash irons of carriages with woven wire or other material which will allow

air to pass through, and therefore offer less resistance, but arrest dirt.

The provisional specification describes a method of using a pole instead of shafts, with one horse only.

[*Printed, 10d. Drawing.*]

A.D. 1856, January 3.—No. 14.

HAINES, FREDERICK.—Preventing concussion. For this purpose the patentee makes use of cork. For carriage purposes he places a block of cork, “of any necessary thickness and form, between the springs and beds,” “in conjunction with layers of woollen or other fibrous material, secured by means of an iron plate, or straps of iron or other metal.” For the journals or axleboxes, he uses “a ring or collar of cork to prevent the grease or other lubricating material from escaping between the arm of the axle and collar of the wheel.” This cork collar is said not to char when heated. Cork is also applicable to doors and door frames.

[*Printed, 4d. No Drawings.*]

A.D. 1856, January 3.—No. 19.

LYALL, JAMES BAGSTER.—Improvements in carriages. These improvements relate to the invention No. 13,604, A.D. 1851. They refer chiefly to carriages “which have two (at the least) splayed or skewed doors for entrance and exit, but some points or portions may be found applicable to carriages not having such like doors.”

The patentee says, “instead of the longitudinal seat divided into two by a back or partition, so as to seat the passengers back to back in the middle of the omnibus, such seat extending the whole length thereof, which is the case when my former invention is adopted, I now by this invention make such seat much shorter, and beyond the same I have a commodious and curved space with suitable seat, which I term a saloon. By this arrangement I am also enabled to give the front of the carriage (at the sides) the form of a barouch, by which I obtain a high front wheel with considerable “lock,” and consequently much diminish the draught and improve the appearance. For the ascent to the roof I use steps crossing the panelled space between the two

“ doors (there being two as in my form) with aer invention  
“ hand rail. I arrange the outside roof seats in accordance  
“ with my former invention, in so far as to seat the outside  
“ passengers face to face, with their feet in a trough; but I  
“ do not now extend this the whole length of the omnibus,  
“ in order to give greater head room in the saloon part. I  
“ construct the roof of the omnibus by taking the roof sup-  
“ ports from the side pillars and fastening them to the centre  
“ plank, which plank is supported by a column, whereby any  
“ collapse of the sides is prevented, thus securing great  
“ strength combined with lightness. To facilitate stopping  
“ the omnibus I use a cord in connection with a knocker.

“ As regards the new improvements in the invention of my  
“ two-wheeled carriages, patented as aforesaid, I arrange the  
“ springs by placing them beneath the carriage, making them  
“ of suitable shape, so that the loss of space between the  
“ wheels and the body of the carriage is obviated, and the  
“ space added to the interior, rendering the carriage more  
“ commodious and comfortable. I remove the square box  
“ behind, now resting upon the hind spring and supporting  
“ the driver's seat, and attach the said seat to the body of the  
“ carriage, thereby removing the leverage to the axle and  
“ lessening the pressure on the horse's back, and shortening  
“ the length. I construct the front of the carriage of a con-  
“ cave form, by which the horse is brought nearer to his  
“ work, and the pressure on his back thrown more upon the  
“ axle, and the draught diminished. The doors are skewed  
“ being arranged so as to afford greater facility of en-  
“ trance.”

[*Printed, 7d. Drawing.*]

A.D. 1856, January 11.—No. 84.

CLARKSON, THOMAS CHARLES.—Material for the construction of carriages, &c.

This material consists of thin sheets of wood or cork alternated with canvas or prepared leather, the whole being treated with marine glue or dissolved shellac, or similar adhesive substances.

This material may be worked up in various ways. It may be made into spars or beams, with iron strengthening pieces

or cores if necessary, or hollow elastic boards may be made of it by cementing sheets on to frames or stretchers. It may also be used simply on boards or panels.

[*Printed, 10d. Drawing.*]

A.D. 1856, January 18.—No. 134.

MOSELEY, JOSEPH.—(*Provisional protection only.*)—Transport of merchandise, &c. in rotating cylinders. The invention consists in a “machine of a spherical, cylindrical, or barrel” form, or two or more of such machines attached together, “into which” goods and merchandize “are to be placed or” packed, and the machine or machines to be drawn along “by horses or other beasts of draught or burden, or by steam” or mechanical power, by means of shafts or traces attached “to two pivots placed on opposite sides or ends of such” machine or machines, so that such machine or machines, “shall move along the ground with a rotatory motion in the” direction in which they are drawn, and bearing such” goods and merchandize “so placed as aforesaid when of a” solid or material nature in a rotatory motion also.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, January 18.—No. 140.

MYERS, EDWARD.—(*Provisional protection only.*)—Springs. Two or more annular vulcanized india-rubber springs are fitted in a box or casing, each spring in a separate compartment, the compartments being concentric, so that the inner springs will be of smaller diameter than the outer ones. The bearing or buffer rod has a series of projections upon it, so arranged that, as the rod is more and more compressed with the spring, the projections will consecutively come into operation each with its own spring.

[*Printed, 3d. No Drawings.*]

A.D. 1856, January 21.—No. 157.

HADDAN, JOHN COOPE.—Omnibuses, &c. The first part of this invention consists in causing the windows or shutters in omnibuses to lift up into a double framing or case on the roof instead of dropping down into a space left in the framing of the sides of the omnibus. The case on the roof will serve

as a footboard for outside places and by dispensing with the space in the sides of the vehicle more room for passengers may be obtained.

The invention also consists in making the part of the floor nearest the door of the omnibus lower than the rest, so as to give more head room near the door where it is required.

[*Printed, 7d. Drawing.*]

A.D. 1856, January 22.—No. 164.

GEDGE, JOHN.—(*A communication from M. Charpentier.*)—(*Provisional protection only.*)—Wrought iron wheels. The nave of the wheel is of iron “prepared by means of a mould stamp  
“acted upon by hammering. The circle in the nave for the  
“reception of axle can be prepared, the metal being in a cold  
“state, with a planing or mortice machine, or in a heated  
“state in a mould by the operation of the hammer. The  
“grooves in the circle prepared for the axle can also either  
“be made in a cold state by the mortice or plane machine,  
“or in a heated state in a mould and hammered. These  
“grooves traverse the entire circle prepared for the axle.  
“A ring is soldered or welded on the axle. The mould is so  
“formed, that in the boss will be left a number of holes (of  
“any desired form) equal to the number of spokes to be used  
“in the wheel, which may be made at once to fit into these  
“holes by being made to their form or shape. These spokes,  
“so prepared, are put each into its socket, and the felloe is  
“then put on in circle in the usual manner.

“The wheel is now placed in the fire or furnace and when  
“the axle has attained a proper heat, a ring in the same state  
“is placed in that part of the boss where the ends of the  
“spokes meet, and then the whole is soldered or welded  
“together by hammering. The pieces composing the felloe  
“are united in the ordinary manner with a wrought-iron  
“tyre.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, January 25.—No. 199.

COLLINS, WILLIAM WHITAKER.—(*Provisional protection not allowed.*)—“An elastic junction applicable to carriages and  
“other purposes.”

This is a proposition to attach thin layers of unvulcanized india-rubber to the metal plates to be connected. A thicker piece of rubber is then interposed between the surfaces already attached and the whole vulcanized.

[*Printed, 5d. Drawing.*]

A.D. 1856, January 30.—No. 248.

WALSH, JOHN HENRY.—(*Provisional protection only.*)—Omnibuses. This chiefly relates to the arrangement of seats in public carriages. The inventor places seats for inside passengers, one behind the other at each side of the central avenue or passage. They face the horses and each seat is higher than its neighbour so as to afford room for the knees and legs of the occupant of the latter. Four seats arranged in a semicircular form, are placed at the end with their backs to the horses. These seats have a footboard raised above the floor of the omnibus, in order to make room for the feet of the two nearest side passengers. The seats may be partitioned off up to the roof, if desired. The roof is inclined. On the roof the seats are arranged in a semicircular form with backs to the horses; and immediately over the door are two seats, facing forwards. The front outside seats are as usual.

There is also described a method of communicating with the conductor. A rod runs along the roof on the inside and is fitted with a dial, index hand and bell. It has handles for the passengers. A passenger wishing to stop pulls down the handle and then releases it on that side of the vertical position which corresponds with the side of the road on which he wishes to alight. The bell calls the conductor's attention and the index shows what is required.

[*Printed, 3d. No Drawings.*]

A.D. 1856, February 1.—No. 282.

HOOPER, GEORGE NORGATE, and HOOPER, WILLIAM.—Springs. "This invention relates to the employment of india-rubber springs in combination with the steel bearing springs of carriages and vehicles of all kinds, and also to the employment of india-rubber springs for suspending the cushions of carriages, chairs, beds, mattresses, and other similar articles, in such a manner that a compensa-

“ tion action is obtained in proportion to the weight or load  
 “ to be carried or supported.

“ The improvements consist in applying india-rubber  
 “ springs in the form of endless bands or rings, or in straight  
 “ lengths, in combination with the steel springs for carriages  
 “ with or without perches, and in using them in such a  
 “ manner that that the springs shall be brought either into  
 “ simultaneous or into successive action, according to the  
 “ weight of the load which is placed upon them; that is to  
 “ say, when carrying the weight of one person a part only  
 “ of the springs would be acted upon when two persons are  
 “ carried, the increased weight will bring into action a fresh  
 “ set of springs; and on receiving the full load, the whole  
 “ or nearly the whole of the springs will be brought into  
 “ action; the carriage or vehicle thus rendered easy at all  
 “ times, whether carrying the whole or part only of the  
 “ load.

“ The compensating effect is obtained by employing india-  
 “ rubber springs of different lengths, so that the shorter  
 “ ones will come into action first, and then the longer ones,  
 “ and finally the whole or nearly the whole of the springs  
 “ with the steel spring to which they are connected. Cushions  
 “ and other similar articles are suspended by several india-  
 “ rubber springs of different lengths, or by the supports  
 “ being of varying lengths so that the same compensating  
 “ effect will be obtained as that described with regard to the  
 “ bearing springs. It will be obvious that the compensating  
 “ or auxiliary india-rubber springs may be applied in various  
 “ ways, according to the various arrangements of bearings,  
 “ springs, and modes of suspending carriages and vehicles  
 “ generally; but the same principle of compensation, how-  
 “ ever is adhered to in all the different arrangements or  
 “ modifications to which the compensation springs may be  
 “ applied.”

[*Printed, 9d. Drawing.*]

A.D. 1856, February 1.—No. 284.

DUCKETT, GEORGE. — (*Provisional protection only.*)—“ Im-  
 “ provements in carts and vans.”

“ This invention has for its object the construction of carts  
 “ and vans, in such manner, that they may with convenience



“ be used either open or closed. For this purpose each cart  
 “ or van is made with a moveable cover at the upper parts,  
 “ which cover descends to the foot board, and it may have  
 “ attached thereto a small dash board, or the dash board  
 “ may be fixed to the fixed foot board of the cart or van at  
 “ the back. The cart or van is made with a flap in the  
 “ ordinary manner. On the upper and at the front part of  
 “ the cover is made and fixed a driving seat, by which  
 “ arrangement, when the cover is placed on the cart or van,  
 “ it will be closely covered at the top and in the front, and  
 “ it will be closed in by the flap at the back. When the  
 “ cover is lifted off or removed it will be an ordinary open  
 “ cart or van.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, February 2.—No. 289.

WARD, JAMES TOWNSEND.—Omnibuses. The patentee describes his invention as follows:—It consists “ of a new or improved  
 “ omnibus, in which the parts and seats are arranged as  
 “ follows:—The posterior part, that is to say, the part at  
 “ which the passengers enter, is of less diameter than the  
 “ anterior portion, and the seats in the two portions are  
 “ arranged differently. The seats in the anterior portion are  
 “ arranged as in the ordinary omnibus, that is to say, the  
 “ passengers sit with their backs to the sides of the omnibus,  
 “ those situate at the opposite sides facing each other. The  
 “ end of the anterior portion is semicircular, and in this  
 “ portion the passengers sit with their backs to the sides of  
 “ the omnibus. In the posterior, or narrow part of the  
 “ omnibus, the seats are differently arranged. The passengers  
 “ sit as in an ordinary carriage, that is to say, the seats  
 “ are situated transversely, there being two seats on the  
 “ right and two on the left of the door. The persons occupy-  
 “ ing these seats sit face to face, as in an ordinary carriage,  
 “ and there is a clear space up the middle, giving access to  
 “ the anterior portion of the omnibus, which space is not  
 “ interfered with by the occupation of the seats near the  
 “ door. On the roof the seats are arranged in two rows, the  
 “ occupants being back to back, but between the two rows  
 “ of seats on the anterior portion of the omnibus, a consider-  
 “ able amount of unoccupied room is left, which may be used

“ for luggage and other purposes. For gaining access to the top, I place a step against the projecting part of the body, a second at the side, and a third at the side, and partly at the back, and I place a guard over the wheels to prevent accidents in getting up and down.”

[*Printed, 6d. Drawing.*]

A.D, 1856, February 2.—No. 291.

NAPIER, GEORGE. — (*Provisional protection only.*) — Brakes. The first part of this invention relates to brakes for railway purposes; the second part to brakes for vehicles for common roads, and principally adapted for omnibuses or coaches carrying heavy loads. “It consists of a break or rubbing” surface “applied to one or both of the hind wheels of such vehicles and supported from an arm or lever mounted in a suitable position on a cross shaft. This cross shaft has another lever in the middle, which is connected with a long rod carried forward under the pole. This rod has a joint central with the centre of the locking plate of the fore carriage, in order that it may be deflected in either direction on the fore carriage moving round without throwing the rod out of action. This rod is carried forward to a sliding piece fitted on the point of the pole to slide to and fro some short distance. The chains or strap or other fastening from the horses collars to the point of the pole, instead of being fixed thereto, are carried over two sheaves or pulleys and back to the sliding piece before mentioned. The action of the break is this:—When the horses are pulled up they strain upon the chain or strap of the collar, which forcibly pulls the slide forward on the pole and with it the rod communicating with the break levers, bringing the breaks in contact with one or both of the hind wheels. In backing the carriage a stop is placed immediately under the coachman’s box, and in communication with a raised knob in his footboard. By placing his foot on this knob, and depressing it, he throws the stop into gear with the break rod under the pole, and prevents its movement in a longitudinal direction, whereby the action of the break will be suspended, and the carriage will ‘back’ as in the ordinary manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, February 4.—No. 300.

HUDSON, CHARLES HENRY.—(*Provisional protection only.*)—

“A retiring door or lid for boxes, cabinets, closets, rooms, carriages, and for all places or receptacles where or in which doors or lids are at present in use or may be used.”

“This invention consists in providing the room, box, cabinet, or other receptacle with grooves corresponding with each end or side of the door or lid thereof; a guide piece sliding in such grooves carries the door or lid by means of hinges, and by guiding the same in the said grooves (aided in some positions by runners) entirely retires the door or lid, causing the front of the room, box, or other receptacle, when open, to present a perfectly flush appearance, thereby obviating the various inconveniences arising from the presence of such doors or lids when open.”

[*Printed, 6d. Drawing.*]

A.D. 1856, February 5.—No. 316.

WILLIAMS, THOMAS.—(*Provisional protection only.*)—Omnibus.

The invention, according to the inventor, “consists in constructing the shells or bodies of the said omnibuses, so that by a central arrangement of seats the persons seated within the body or upon the roof thereof may pass to or from any of the said seats without inconvenience to the rest of the passengers. To effect this object, I cause the shell or body to be rounded at the front, and at the back to be provided with convenient steps or stairs to communicate with the roof. Between each of the said seats, which are to be arranged in longitudinal rows upon the outside or roof of the omnibus, an intervening space is allowed for the knees of the passengers who are to sit facing the driver, whilst a space or footway between each of the said rows of seats is made to communicate with the steps or stairs. A cover or awning supported upon semicircular bracket frames, is made to draw or fold over the outside passengers at pleasure. Omnibuses on this principle may be constructed for one or two horses to draw, by employing the upper portion or roof and awning as a single omnibus.

“I claim, firstly, the constructing of omnibuses with inside central seats; secondly, an arrangement of outside seats

“ upon the roof facing the driver, divided transversely and  
 “ longitudinally ; and thirdly, the covering or closing in of  
 “ the top or roof seats by means of an awning and moveable  
 “ brackets.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, February 6.—No. 325.

TYERMAN, THOMAS FREDERICK. — Umbrella stands for omnibuses, &c. “ This invention has for its object the application of apparatus to omnibuses and other carriages for receiving wet umbrellas ; for which purpose on the door or other part of an omnibus or other carriage is formed an enclosed space, by preference of sheet metal, forming a trough for the reception of the ends of umbrellas. The upper part of the enclosed space is made into a frame, in order to receive several umbrellas. The water flowing from the umbrellas into the trough or lower part of the apparatus is conducted out of the carriage by a suitable outlet.”

[*Printed, 5d. Drawing.*]

A.D. 1856, February 13.—No. 366.

FOX, SAMUEL.—Springs. This invention consists simply in substituting for the ordinary flat or tapering plates of steel now used for springs, similar plates corrugated longitudinally “ by which lighter springs may be constructed for supporting a given weight.”

[*Printed, 5d. Drawing.*]

A.D. 1856, February 16.—No. 401.

PARKER, FREDERICK.—(*Provisional protection only.*)—“ Improved apparatus for affording exercise to the human body.”

This apparatus is intended partly for use as a velocipede. It is contrived by “connecting together certain levers, “treddles, wheels, springs, and weights, and combining them “with a seat into an apparatus, by the use of which persons “sitting thereon may avail themselves of similar exercise in “a room to that obtained on horseback out of doors. Another

“ form of construction of apparatus, according to this invention, consists in so constructing and arranging the several parts as that they have to be operated upon by persons, either in a standing or sitting posture, with the feet and hands, so as to bring as much as possible of the muscular system into action at one time; and further by applying the power thus exerted to the turning of a wheel, with vanes or fans fixed around the same, the air may be disturbed, and the salubrity of the atmosphere in the room improved. The above apparatus may either be fixed in a room, or it may be used out of doors as a locomotive vehicle, in which last case it would require to be mounted upon wheels.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, March 1.—No. 527.

MILLER, ROBERT FREDERICK.—(*Provisional protection only.*)—

“ An improved omnibus.”

This invention consists “ firstly in doing away with the ordinary seats and brackets, and making the bottom side of the body form the seats, the passage along the centre being formed by carrying the woodwork down from the front part of the seats.

“ Secondly, raising the roof in the centre, to form a convenient seat outside, and carry the ‘ rocker ’ or lower body down 4 inches lower than usual, thereby obtaining increased height within the vehicle.

“ Thirdly, extending the fore part of the body, in order to obtain greater space inside without increasing the total length.

“ Fourthly, doing away with the top ventilating rail and ‘ mahogany,’ and carrying the glass up to the framing.

“ Fifthly, carrying the pillars or frames down straight, thereby increasing the internal width.

“ Sixthly, doing away with the hind cross spring, and fitting the front carriage with a double wheel plate, transom, &c.

“ Seventhly, carrying rails round and along the roof and bottom side of the same, and fixing extra brass rods for handholds.

" Eighthly, improving the lighting and ventilation at the  
" fore part of the vehicle."

[*Printed, 3d. No Drawings.*]

A.D. 1856, March 12.—No. 600.

CORBITT, WILLIAM, and SHAW, GEORGE.—(*Provisional protection only.*)—" Buffer, bearing, and draw springs for railway  
" and other carriages."

If " metallic elliptic springs are employed," the inventors  
" place them in a box or case singly, and not on each other  
" in a succession of plates as in the ordinary springs, and  
" in the interior of the case are made slides or grooves for  
" the plunger to work in, by which the bearing is increased  
" in proportion to the action of the buffer or spring. At or  
" near the centre of the springs, where they touch each other,  
" are placed india-rubber rings, so that when in action and  
" driven home, the india-rubber being in the interior of the  
" springs will prevent them from coming in contact with  
" each other, and will present an additional resisting force by  
" its elasticity, and along with the proper adjustment of the  
" length of plunger, the extreme weight or pressure is taken  
" off the case and spring, and prevents them being broken by  
" concussion."

[*Printed, 3d. No Drawings.*]

A.D. 1856, March 18.—No. 641.

DE PRADES, PETER.—(*Provisional protection only.*)—" Wheel-  
barrows. This invention consists in constructing wheel-  
barrows in such a way that it shall not be necessary to throw  
them on their sides in order to empty them.

The legs and handles are secured to a horizontal cross bar  
" from the centre of which at right angles proceeds another  
" bar, forked at its further end, to receive the wheel and  
" axle, or a wheel may be placed on each side. On the centre  
" bar, between the wheel and front cross bar are two raised  
" bearings to receive corresponding axles attached to the  
" bottom of the wheelbarrow body, which can thus be made  
" independent of and adjustable to the framework. The body  
" is made of any desired size and form suitable for the frame  
" to which it is to be attached by its axles, observing that it

“ does not hang over or touch the inside of the front cross  
“ bar, but will readily turn down on either side of the centre  
“ bar; to keep it, however, firmly in a level position, the  
“ inventor affixes a sliding bar on one side of each handle,  
“ arranged so that the workman can withdraw the right or  
“ left hand bar as required, thereby unbolting and tilting the  
“ barrow body. The tilting bolts being operated by spiral  
“ or other springs, the barrow body can be quickly reset as  
“ at first. To render the body easily removeable, I make the  
“ top of one bearing hinged, and secure it by a bolt, which  
“ when removed, one axle being raised, the other may be  
“ freely drawn out.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, March 22.—No. 671.

MURPHY, JAMES.—“ Improvements in means or apparatus  
“ for stopping or retarding vehicles used on rail or other  
“ roads, which improvements are also applicable to the brake  
“ wheels in connection with stationary engines.”

The invention is described in its application to a railway train. It consists in supplying the various carriages with steam cylinders supplied with steam through pipes connected by suitable couplings. The piston of each cylinder acts on the brake blocks which may be arranged in various ways according to circumstances. Guards are placed below the framing of the vehicles for the purpose of catching any of the pipes or other parts of the apparatus that might become loose.

[*Printed, 10d. Drawing.*]

A.D. 1856, March 22.—No. 689.

CAREY, CHARLES.—(*Provisional protection only.*)—Seats for omnibuses. This improvement is intended to be applied where the seats of public carriages are divided by elbow rests or partitions, allotting a given space to each person. It consists in making each elbow rest or partition moveable so that “ when a stout or large person is desirous of being a passenger, such person may be accommodated by removing the  
“ partition or elbow which divides the space ordinarily suitable  
“ for two passengers.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, March 26.—No. 723.

RANKIN, PATRICK SCOTT.—(*Provisional protection only.*)—Propelling vehicles. This invention relates to the application of human muscular power to propulsion. “In applying this  
“ invention for locomotive purposes, the cart, carriage, omni-  
“ bus, waggon, or other vehicle has fixed upon or within it a  
“ geared lever arrangement, of which one modification is con-  
“ trived in this way; at any convenient part of the vehicle there  
“ is fixed up a winch handle shaft, carrying a spur pinion in  
“ gear with a duplex rack, similar to that frequently employed  
“ in printing machinery and in mangles, for giving reversing  
“ reciprocating actions from the continuous rotatory action  
“ of a driving wheel. In the present arrangement this  
“ duplex rack consists of an open frame, toothed on its two  
“ opposite inner sides, the distance between these two lines of  
“ teeth being somewhat more than the diameter of the  
“ actuating pinion contained in the opening of the frame.  
“ The two ends of the rack frame are plain untoothed curves,  
“ each having a stud pin fast therein, to catch the teeth of  
“ the driving pinion as the end of the frame approaches to  
“ it, and turn it over to gear with the opposite rack. One  
“ side of the frame has a double groove down it from end to  
“ end, a fixed pin in the framing of the apparatus being con-  
“ trived to gear in such groove first on one side and then  
“ on the other, to suit the side with which the pinion is in  
“ gear; this steadies the frame in its two positions, and as  
“ the pinion continuously rotates, it gives the long double  
“ rack frame a continuous reciprocatory traverse vertically.  
“ The upper end of the rack frame is fast to the end of the  
“ longer arm of an unequally divided lever, which is set to  
“ oscillate on a fixed centre in the stationary framing, the  
“ opposite shorter arm of this lever having its extreme end  
“ jointed or attached to the upper end of a second duplex  
“ rack frame.

“ This second rack frame encircles a larger spur pinion fast  
“ on the shaft to be driven, and as the frame traverses up  
“ and down continuously its action communicates a continuous  
“ rotatory motion to the pinion, and thence to the wheels of  
“ the vehicle to be propelled either directly or through the  
“ intervention of gearing. This second rack frame is also



“ formed with a double longitudinal groove on one side, a  
“ stationary spring guide piece being employed for bringing  
“ the two opposite sides of the rack frame into gear with  
“ the pinion alternately. This spring top is a stationary  
“ stud, so contrived upon a free centre that a slight spring  
“ may be set to give it an inclination either one way or the  
“ other ; hence, when the apparatus is in action this stud  
“ travels up one groove of the frame and down the other  
“ alternately, its set causing it to bear over and pass in the  
“ proper direction through the two end spaces which join the  
“ two grooves. In this way, a man turning the winch handle  
“ can give a continuous rotatory action to the pinion of the  
“ second rack frame in either direction at pleasure without  
“ reversing his turning, merely by setting the stud of the  
“ rack frame. Instead of working the apparatus by pinion  
“ and rack on the long arm of the lever, the movement may  
“ be given directly to the lever by hand, or in other ways.  
“ Such machinery is well suited for effecting the locomotion  
“ of vehicles of various kinds, whilst it also answers for  
“ driving stationary machinery.”

*[Printed, 3d. No Drawings.]*

A.D. 1856, March 26.—No. 725.

ROCK, JAMES, the younger.—Improvements in carriages. The first of these improvements consists in constructing hoods or covers for vehicles of folding panels, either solid or built up of strips, or consisting of frames covered or filled in with metal, leather or textile fabrics. These panels are hinged together according to the nature of the carriage. They collapse, fold, or shut up in various ways and are removeable or not from the vehicle as may be desired. When shut they may also bear seats, and be fitted with guard rails.

Another improvement relates to a method of locking the fore wheels of carriages, “whereby these wheels may be placed more backward, or nearer to the hind wheels.” Each of these wheels is carried by its own axle, forming part of a bar working in vertical sockets. Suitable springs are attached to these bars. To each bar is attached a rod and these rods crossing each other, serve to actuate or steer the wheels by pivoting their axles.

Another improvement has reference to the hinges of car-

riage doors. The improved hinge has a pivot or gudgeon of considerable size to allow for wear. The upper hinge consists of two plates, one carrying the pivot being attached to the door, the other to the body. A segmental groove cut in the plates, in which works a pin, acts as a stop to the opening of the door. The lower hinge is also formed of two plates, curved to suit the shape of the body, one attached to the door, the other to the body.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1856, April 2.—No. 791.

YOUNG, FRANCES.—Two wheeled open carriage. This carriage may be driven from the inside or from a moveable driving box. For the former purpose a "rein bearer" is adapted to the front of the carriage for the purpose of raising the reins out of reach of the horse's tail. This takes the place of the driving box, which however may easily be substituted for it as required. "The seats in the body of the 'carriage' are arranged across the back and front of the same. The back seat is formed in two parts, one such part being fixed to the body and the other hinged thereto, to enable persons when such is raised to enter the vehicle or carriage by the door at the back thereof; a bracket or other contrivance being fixed on the under side of the said seat, falls into a loop on the inside of the door and effectually locks the door, so that it cannot be opened until the hinged seat is raised." The shafts may be passed through the front of the body in order to raise them somewhat higher than usual.

[*Printed, 6d. Drawing.*]

A.D. 1856, April 2.—No. 792.

ROBERTS, RICHARD.—Omnibuses and carriages. The improvements are classified by the patentee under the following heads:—

Firstly, "jointing the fore axle to a vertical pin or shaft on which it swivels."

Secondly, "in supporting the fore end of carriage bodies on caoutchouc or other springs resting on the swivel pin."

Thirdly "in contracting the gauge of the fore wheels to enable them to work between instead of below the bottom

“ side beams of the carriage, and to allow of steps being placed outside the wheels without projecting inconveniently.”

Fourthly, “ in widening the central portion of the roof of omnibuses, so as to admit of a passage between the persons sitting on each side of it, and in the application of a hand rail at each side of the passage.”

Fifthly, “ in causing the covering boards of the outer portions of the roof of omnibuses to project beyond the sides to afford room for the feet of the passengers.”

Sixthly, “ in extending the lower portion of the risers beyond the body of the omnibuses for supporting the canopy and footstep, and in constructing the guards’ canopy to form a communication between the sides of the roof,” and

Lastly, “ in placing the fulcrum of the brakes further than usual from the circumference of the wheels.”

In detail the invention comprises methods of ventilating the vehicle, of lubricating axles by means of oil contained in holes bored therein; of suspending vehicles upon their wheels, of constructing the latter, and of applying springs of india rubber or steel.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1856, April 2.—No. 799.

HINE, HENRY GEORGE.—Perambulators. This invention consists firstly in constructing children’s and invalid’s perambulators in such a manner that the body is detached from the wheels and is suitable for use as a chair. “ This power of separating facilitates the placing of a child in the chair and then fixing the chair to the frame and wheels, which will be advantageous in some cases; or the body of the carriage may be fixed to and form part of the framing of the carriage.”

Secondly, the handle of the carriage is connected with a brake so that should the handle at any time be released by the person pushing the carriage, the brake is automatically applied and the carriage prevented from running away if on an incline.

[*Printed, 6d. Drawing.*]

A.D. 1856, April 3.—No. 807.

ABRAHAM, HENRY ROBERT.—(*Provisional protection only.*)—Passenger indicator. The first part of this invention relates

to the design of passengers' tickets; according to the second part "the improvements in machines used as tell-tales for counting or recording the passing by of a number of persons is that of causing the passenger to displace by lever, or connected machinery, balls, pellatts, or substances which fall into a receiver; each ball, pellatt, or substance indicating the passing of an individual person or thing."

[*Printed, 3d. No Drawings.*]

A.D. 1856, April 7.—No. 844.

FULLER, WILLIAM COLES.—India-rubber tyres. This tyre is a combination of "cloth, canvas or other fibrous material and sheet rubber in alternate layers or thicknesses" made upon a cylinder corresponding in diameter to the size of the wheel. "The canvas by this means will prevent the india-rubber from unduly stretching and becoming loose in the groove as at present."

This tyre is held on the wheel by side flanges attached to the felloes, or the india-rubber may be attached to a wide strap or band of canvas, the edges of which are turned down and secured by nails or otherwise to the felloes.

[*Printed, 7d. Drawing.*]

A.D. 1856, April 9.—No. 858.

CHIRIMES, RICHARD. — Springs. This invention, which is described in its application to a railway buffer, consists in placing one helical spring within another in a suitable box provided with a plunger. These springs are right and left handed to prevent fouling, inasmuch as there is no partition between them. They may be made of different lengths to obtain a gradually increasing resistance.

This arrangement of spring is "obviously applicable not only to buffers, but also to bearing or draw springs for railway or other carriages."

[*Printed, 6d. Drawing.*]

A.D. 1856, April 19.—No. 938.

HUNT, EDMUND.—"Improvements in hansom cabs and similar vehicles, parts of which improvements are also applicable to other carriages."

The improvements consist, firstly, in providing a door or apron of some flexible material which rolls upon a roller placed underneath the front part of the floor of the cab. This roller is worked by means of pulleys and bands, from the driving box and the interior, so that both driver and passenger are able to open and shut the apron or door.

Secondly, in a method of opening, from the driver's seat, the usual doors of hansom cabs. The doors are worked by cranks or cams placed underneath the floor, which cranks or cams are put into operation by a hand lever and connecting rods.

[*Printed, 9d. Drawing.*]

A.D. 1856, April 25.—No. 993.

HARDACRE, JAMES.—Carriages and wheels. This invention comprises the following improvements:—A method of raising and lowering the hood of a carriage by means of a hand winch worked by the coachman from the box. Several modifications are shown.

An adaptation of compressible bands to the naves of the wheels to serve as a brake ; such bands being tightened on the nave by the tension by rods put in motion by a foot lever or stirrup.

Making the spokes of wheels of a curved shape and of elastic metal, such as steel, so that such spokes serve as springs.

Lining the nave of the wheel with a bush within which the axle works. This bush is held in its place by a nut and screw ; and as each part of it becomes worn it may be turned so as to expose a fresh surface. When worn out it can be replaced by a new bush.

Lubricating the axle by means of a lubricator attached to the end of the nave bush. The oil chamber communicates by a small opening with the part to be lubricated. The oil is fed into the chamber through a perforated screw piece closed by a spring stopper.

Making a carriage polygonal in shape with a seat on each side. These seats when not in use, are boxed up. A drawing shows a two wheeled carriage of hexagonal shape in plan.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1856, May 1.—No. 1032.

CAREY, STEPHEN.—Water carts and barrows. For the purpose of enabling more extended widths to be watered, the patentee fits telescopic perforated tubes to the ends of the usual distributing tube; or he attaches perforated hose to the ends of such distributing tube or to the cart body, the outer ends of such hose being carried by attendants; or he attaches by universal joints to the distributing tube, other tubes governed by ropes and pulleys from a frame or support forming part of the cart.

The perforations in the distributing tubes may be of various forms, or a longitudinal slit may be substituted for them. Again, there may be two rows of holes to each pipe, the water from one row laying the dust raised by the water from the other.

The body of the cart is carried on wheels from 7 to 12 feet high. It may have one or two front guide wheels. If the axle pass through the body, it must be enclosed in a water-tight pipe. The body may also be divided to form a front and back reservoir, connected by valves, so that the axle may pass between them.

The invention also relates to modifications of the above apparatus for the purpose of irrigation, to straining trays for such purpose, also to the valves of the cart and to floats to prevent splashing of the water as it is carried.

[*Printed, 4d. No Drawings.*]

A.D. 1856, May 1.—No. 1033.

BROOMAN, RICHARD ARCHIBALD. — (*A communication from P. Hugon.*)—Cart for the conveyance of gas. This invention relates to improvements in compressing, controlling, and conveying gas, amongst which is included a cart for the transport of gas.

“This apparatus is a vehicle containing a number of  
“cylindrical vessels, all communicating with a rail or gallery  
“at the back of the carriage, provided with as many taps as  
“there are cylinders, so that the supply may be cut off from  
“each cylinder separately. The rail bar is provided with a  
“manometer, to indicate the degree of pressure of gas in the  
“receiver of any particular consumer. Each tap is opened

“ successively until the desired degree of pressure is arrived at. Gas is conveyed from the cart to the consumer’s private receiver through a caoutchouc pipe.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1856, May 3.—No. 1051.

WRIGHT, JOHN, and GORRERY, THOMAS. — (*Provisional protection only.*)—Springs. The invention consists “in using cast or other kinds of steel, or other metal sheets or plates of a less thickness than No. 6 wire gauge, being placed together in the formation of springs instead of plates or bars of a greater thickness . . . by which alteration of thickness . . . greater lightness, elasticity, and durability of the springs are secured.” The invention is claimed to be applicable “to general carriages and vehicles.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, May 7.—No. 1071.

CURTIS, WILLIAM JOSEPH.—Carriages to run on rail or tramways and common roads. “The carriage is made with suitable wheels to run on common roads, but it is preferred that they should be somewhat wider than usual. And in order to cause the carriage wheels when running on tram or railways to keep on the rails, there are additional smaller wheels applied to the carriage, suitable for running in or on the rails, and these additional wheels are capable, by levers and connecting rods or suitable apparatus of being raised and lowered by the driver or other person; hence when it is desired that the carriage shall be retained on the rails, the additional wheels are lowered, and become guide wheels for the carriage; but when the carriage is to run off the rails on to a common road, the additional wheels are raised and kept out of the way, and such is the case so long as the carriage is to run on a common road.”

[*Printed, 10d. Drawing.*]

A.D. 1856, May 9.—No. 1103.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from A. Duboy.*)—“Machinery for the manufacture or finishing of tyres, hoops and rings.”

In this improved machinery the inventor employs “two grooved rolls or cylinders, one placed above the other, and so arranged that when the rolls are in working positions the projections in one roll may come opposite the grooves in the other, and vice versâ. The rolls are supported and revolve in bearings formed in pedestals fixed to a suitable platform or base plate. The rolls are held and brought together, and the distance to which they approach each other is regulated by screws working in nuts in the top of the pedestals; the screws are actuated by pinions and winches, gearing levers, or by any suitable means. The rolls are made to revolve by means of suitable arrangements in the usual manner. The upper roll is coupled to its driving shaft by long coupling, supported on an upright, and so constructed as to allow the roll shaft to move backward and forward in it. The upper roll is raised and lowered in its bearings by means of weighted levers or hooked rods, and is drawn back and brought forward by means of a rack attached to a lug on a collar, which embraces a groove in the roll, the roll, however, being free to revolve within the collar. The rack is actuated by a pinion on a shaft and winches. The action of the machinery is as follows:—The upper roll is first raised by the weighted levers and drawn back by the rack, the tyre or hoop to be flattened, rolled, or finished is placed in a groove in the lower roll, shaped to correspond with the external contour desired to be given to the hoop or tyre; the upper roll is then brought forward placed through the hoop or tyre, lowered into its place by the lever and screwed down to bear against the inner surface of the tyre. Rotary motion is communicated to the rolls in the usual or any suitable manner.”

[*Printed, 2s. 4d. Drawings.*]

A.D. 1856, May 14.—No. 1138.

SCOTT, URIAH.—“Improvements in public carriages, and various parts of the same, which parts may be used separately, and applied to vehicles of any description.”

The seats of an omnibus are placed one behind another on each side of a central passage. The floor gradually rises from the back to the front. This allows for a considerable



increase in the size of the front wheels. Each seat has its own window and is partitioned off from the other seats.

Axles may be made in two parts an inner part or core and an outer or wearing part. These parts should be separated by india-rubber or other suitable material. The lining of the ordinary axle box may be of a "corrugated shape thus reducing " the wearing surface." Felt may be used for lining bearings. For railway purposes, such material and earthenware are proposed by the patentee.

A large circular turn plate is used within which the front wheel, a single wheel only, works. The upper and lower plates are held together by clips.

Naves of wheels may be made of an iron shell lined with wood; the outside of the shell being covered with india rubber, upon which is placed the spoke bed.

The periphery of the wheel, if of iron, is angle-shaped the spokes are attached by lugs or sockets, and on the tire may be a second tire of india-rubber or felt, or both, properly secured by screws or both from the inner tire.

The front springs are semi-circular and take their bearing in V shaped sockets and "keyed india rubber or felt." The upper and lower hind springs are separated by bands of leather or felt. That is to say the ends of the lower springs are secured to the centre of bands which are attached to and form part of the upper spring.

[*Printed, 10d. Drawings.*]

A.D. 1856, May 15.—No. 1156.

MARYCHURCH, WILLIAM, and GRIFFITHS, JOHN.—Shoe for two-wheeled carriages. The part of this drag shoe upon which the wheel rests, is, made to correspond with the configuration of the wheel. This curved portion is supported on an iron frame from which the draught is taken.

The invention also relates to improvements in horse rakes.

[*Printed, 7d. Drawings.*]

A.D. 1856, May 21.—No. 1206.

ALLAN, ALEXANDER, and HUNT, THOMAS.—Springs. The springs described by this specification and illustrated by a large number of figures, are constructed upon the principle

of allowing each plate to receive a share of the load directly. Accordingly the ends of the plates, which may be made of various shapes, and be tapered or not, are individually placed in bearing in the shoe or are otherwise kept distinct from each other so that the load can be applied to each. This principle also enables the springs to be constructed either to receive the load upon all the plates at once, or to bring each plate successively into tension. For the latter purpose the ends of the plates are made of unequal lengths so as to take the bearing as the longer plates are bent out of their normal positions. The shoes of these springs are made self-adjustable. Many modifications are described.

The invention also relates to a method of bending cranked axles, and to other improvements in locomotives.

[*Printed, 1s. 2d. Drawing.*]

A.D. 1856, May 23.—No. 1241.

DIMPFEL, FREDERICK PETER.—(*A communication from Kingston Goddard.*)—Lock nuts for axle boxes, &c. The object of this invention is to dispense with the small clamping screw which is frequently passed through the nut to the male screw for the purpose of locking the nut. In place of this clamping screw, the patentee employs “a small clutch lever or tooth “ cam, mounted in a recess in the flange of the nut or of the “ washers of the nut,” and this takes into the thread of the screw upon which the nut is placed and grips the thread firmly.

[*Printed, 5d. Drawing.*]

A.D. 1856, June 10.—No. 1380.

PREUX, ARMAND EUGÈNE.—Footwarmer. A metal box, strong enough to bear the weight of passengers, is placed on the floor of the vehicle. It is supplied with water through stoppered orifices. Outside the vehicle, at each end of the box, is placed a lamp surrounded by a double chimney which communicates by tubes with the water case. The water is heated in this chimney and circulates through the water casing. An outlet is provided for steam.

[*Printed, 7d. Drawing.*]

A.D. 1856, June 24.—No. 1480.

DAVIES, DAVID.—(*Provisional protection only.*)—Wheel tires. The inventor says, “I take an iron tyre having flanges or projections at the sides, which I shrink on to the fellies of the wheel in the usual manner. I then take a strip or band of leather of sufficient thickness to fill up the space between the flanges of the tyre and fasten it therein in any suitable manner. I then take a second wider strip of leather, which I fasten round the former, securing them to each other and to the wheel by nails or other fastenings passing through to the fellies of the wheel, by which means I form a durable and noiseless tyre.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, June 24.—No. 1485.

ROBSON, SAMUEL SINCLAIR.—(*Provisional protection only.*)—Brake. This brake consists of two conical frictional surfaces. One cone is fitted on the carriage wheel. The other cone is hollow and is placed upon the axle. By bringing the two together by suitable mechanism the friction between them serves as the retarding force.

[*Printed, 3d. No Drawings.*]

A.D. 1856, June 26.—No. 1506.

PORTUS, JOHN.—Adjusting weights in vehicles. This invention relates to the “arrangement and construction of carriages, carts, and other vehicles of the class in which the shafts are inflexibly attached to the body, or are so connected that they do not move independently of the body when the vehicle is in motion, in such a manner that the power of the animal drawing the vehicle may be more effectively applied than according to the existing system of arranging and working such carriages. In carts made according to the invention, the body is disconnected from the axle and its wheels, provision being made for the traverse of the body to a greater or less extent behind or before the axle, just as it may be desired to throw weight upon the shafts, or take weight off them. When a steep hill is to be ascended, the traction of the horse acting upon the cart body draws forward the body and its load so as to give the

“ horse increased power in taking the load up the incline.  
 “ Provision is made by means of suitable gearing for throwing  
 “ the weight behind the axle when the cart comes again upon  
 “ a level part of the road. Conversely, when the cart descends  
 “ a hill, the holding back action of the horse throws the  
 “ weight behind the axle, whilst by means of suitable gearing,  
 “ the driver can at any time regulate and adjust the propor-  
 “ tion of the weight to be thrown upon the shafts. It will  
 “ be obvious to the practical man that this invention is  
 “ applicable to two-wheeled carts or carriages of all kinds.”  
 [Printed, 10d. Drawing.]

A.D. 1856, July 2.—No. 1551.

HEYNS, PATRICK. — (*Provisional protection only.*) — Axles, boxes, and wheels. The following is the applicant's provisional specification :—

“ I form my axles so that each end shall be conical, the  
 “ thick end being at the extremity of the axle, and taper-  
 “ ing inwards as far or a little beyond the part where the  
 “ wheels bear and are fixed.

“ The conical parts of the axle are inclosed each by a cap,  
 “ the interior of which is similarly conical so as accurately to  
 “ fit the axle. These caps, which may be either of metal or  
 “ wood, or a combination of both, are made of two or more  
 “ parts and fastened together and around the said ends of the  
 “ axle by bolts or screws through flanges or clasps, or other-  
 “ wise; the inner end of the said cap is enlarged into a disc  
 “ or other form, and partly hollowed so as to act as a vessel  
 “ for containing a lubricating substance. The interior of the  
 “ cap has a groove or slot cut in it either longitudinally or  
 “ spirally to convey the lubricating substance along and  
 “ around the surface of the axle; or instead of having the  
 “ groove in the cap it may be similarly cut along the axle.  
 “ To prevent the lubricating substance from passing inwards  
 “ from the vessel, a washer passing round the axle presses  
 “ firmly against the inner face of it. The cap being now  
 “ securely fastened to the axle, but free to move round it, the  
 “ wheel is hung centrically upon the cap and strongly fixed  
 “ to it. Instead of making the ends of the axles conical, they  
 “ may be cylindrical, and at a short distance from the ends  
 “ (having previously slid on a well-fitting washer) I fix, weld,

“ or cast a projecting ring or shoulder; the cap which is made as before, except that it may if necessary be all in one piece, and have its inner surface cylindrical, is put over the end of the axle, and the wheel is hung upon it, as before mentioned; and the three, the wheel, cap, and washer are securely fastened together, so that they all move freely round the axle, but cannot become detached from it; or if the washer and cap be connected, the wheel may be secured to the latter by a screw, ring, or band passing over the end of it.

“ I propose also to form a wheel by joining two discs formed of boards in such a way that the grain or fibres of the boards of the one disc shall be at right angles to the fibres of those of the other disc. I form the tire of the said wheel of angle or T-iron, the discs being fastened to the vertical leg of the tyre; the nave may be of wood or metal, or of combinations of these centered and fastened to the discs. In some cases I form the naves of my wheels of cells of cast or wrought iron fastened together, the intervals between the spoke sockets being filled up with wood pressed in. I arrange my spokes so that their broadest faces shall be parallel to or in a plane with the plane of the wheel.”

*[Printed, 3d. No Drawings.]*

A.D. 1856, July 18.—No. 1692.

HIPKINS, GEORGE FREDERICK and BRITTEN, JOHN.—“ Improvements in applying springs or weights for the purpose of closing doors, or resisting shocks, strains, or pressure.”

This invention is set forth at considerable length and includes many claims. A large part of it relates to various arrangements of door springs.

It also includes the application of knuckles and curved or corrugated straps of elastic metal, arranged so as to act as stretched knuckles, to the construction of marine or ships buffers and railway carriage buffers and draw springs, such knuckles and straps being also applicable in the construction of the bearing springs of carriages, whether combined with links or legs or otherwise.

The invention further includes means of constructing and

casing compound corrugated straps of steel or other elastic metal; also an "elastic chain" which may be used as a substitute for a single curved or corrugated strap.

Buffers are also described as being furnished with springs composed of thin corrugated plates, which are arranged in sets with the corrugations of those of each set fitting each other, but the several sets being so placed that the outer curves of one set meet the outer curves of the next. The outer plates of the several sets are connected by hinges and work upon bearings of well oiled wood or metal. The corrugations of these plates run "crossways or lengthways or "diagonally," and the plates are surrounded by some flexible material or the boxes in which they work are provided with stuffing boxes in order to protect them from the injurious effects of wet weather.

Buffers and bearing springs are also set forth as consisting of the combination of a curved spring with a flat surface against which it is pressed when acted upon, different arrangements of this part of the invention being described, in some cases curved springs being combined with flat surfaces and in other cases with inclined surfaces, while in one arrangement four curved springs are combined together without either a plane or an inclined surface. Straight springs may in like manner be bent over curved or irregular surfaces.

Bed and other springs are set forth as being composed of "taper plates wound into a conico-convolute form or shape" and also of curved springs combined with flat and other surfaces.

[*Printed, 1s. Drawing.*]

A.D. 1856, July 31.—No. 1811.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—"An improvement in the construction of carriages and wag-gons." India rubber, or other similar elastic material, is applied, wherever possible between the parts of the vehicle, by which means vibration and noise are prevented. The application of the system is shown in the specification of a drawing and description of the fore carriage of a vehicle. The elastic material is there shown as applied to prevent jar in the locking plate, the transom bolt, the transom, and

other parts. It is also fitted to the attachments of the shafts or pole.

[*Printed, 5d. Drawing.*]

A.D. 1856, August 12.—No. 1891.

DOWNING, JESSE WEAVER.—(*Provisional protection only.*)—Metallic and other wheels. The first part of this invention relates to the manufacture of metallic wheels by casting the “bushes or bosses” on the ends of the spokes, and, where the wheel is secured on the axle, on the axle also. It also consists in making the tires of non-metallic wheels “by placing a flat annular plate on either side of the wheel, the said plates being parallel, and their edges flush with the edge of the wheel. The said plates are fixed on the wheel by pins or screws or other such like fastenings passing through the said plates and wheel and binding the whole together.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, September 15.—No. 2152.

MOREAU, FÉLIX.—(*Provisional protection only.*)—“Improvements applicable to the tops of omnibuses and other carriages.”

“This invention simply consists in protecting passengers on the top of omnibuses and other vehicles from the rain or the inclemency of the weather by means of a covering in the form of a marquee tent or of a roofing of any description to be partly fixed and partly moveable, or it may consist of a simple tent covering only.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, September 17.—No. 2176.

ANDRAUD, ANTOINE.—Wheelbarrows. According to the inventor, this invention “relates, first to the particular arrangements and application of two wheels to wheelbarrows instead of one, as in ordinary, whereby the axle may be brought nearer to the centre of gravity of the load without prejudice to the stability of the barrow, the work of the driver being at the same time lessened by reducing the load on his hands.

“I form the axle in two parts, divided transversely to its length; each part of the axle is furnished with a wheel, which is placed near the end of its respective part. When the barrow is to be used for purposes in which it is not intended to be upset for discharging its load, the parts of the axle are arranged with the longer ends or naves placed next to each other, so that the wheels are situated wide apart, thereby giving great stability to the barrow. When it is desired that the barrow should be upset, the positions of the wheels are altered and they are brought closer together, but still at some little distance from each other.

“I form the body or compartment of the barrow for carrying the load partly over the wheels, thereby diminishing the load on the hands; and in order that it may be readily upset or inverted in either direction, I make the backboard of the barrow large and of a somewhat oval form, on which it may be rolled over in upsetting, and again righted with less exertion than is the case in barrows without such oval form at the back.

“In some cases I place the two wheels between the operator and the load, so that he has no load to support, but, on the contrary, he is partially relieved of his own weight by resting on the shafts or handles to keep them down.”

[*Printed, 6d. Drawing.*]

A.D. 1856, September 20.—No. 2208.

**HEES, RICHARD VAN.**—(*A communication.*)—(*Provisional protection only.*) Wrought iron wheels. “This invention applies to the manufacture of what are called plate or disc wheels, and the improvements consist, firstly, in rolling the disc and the nave of the wheel in one piece, secondly, in giving a dished or concave form to the disc, so as to impart elasticity thereto; and, thirdly, in the method of rolling up a rim or flange around the periphery of the disc for the purpose of attaching the tyre thereto.

“In order to roll the discs with the solid nave in the centre all of one piece, two rollers are employed, an annular groove or indentation being turned in the periphery of each, corresponding in width and depth to the dimensions of the nave.” “The disc, which is now flat, is to be turned to the



“ required diameter, and the nave bored out; it is then  
“ re-heated and taken to the machine for giving it the dished  
“ or curved form, and rolling up the flange. The disc is  
“ placed upon a horizontal revolving plate, which is smaller  
“ in diameter than the disc by the width of the required  
“ flange, the upper surface of the revolving plate or roller  
“ being dished out to the required form. The axis of the  
“ plate extends upwards through the nave of the disc, which  
“ is screwed down by means of a nut until it is held firmly,  
“ and the required concavity imparted to the disc. A  
“ roller is now brought down upon the upper edge of the  
“ disc, and as it revolves is gradually brought from a  
“ horizontal into a vertical position, so as to bend or roll up  
“ the edge of the disc into the form of a rim or flange at right  
“ angles to the disc. The outer circumference of the disc is  
“ prevented from getting too cool during this operation by  
“ means of a fire, which is in a trough extending nearly  
“ around the revolving wheel or plate and may be blown by  
“ a fan or bellows. The wheel is now complete except the  
“ tyre, which is made and fixed to the flange or rim either by  
“ shrinking, rivetting, or any other suitable means.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, September 22.—No. 2224.

WALLACE, THOMAS.—Wheels, axles, and axle boxes. The patentee in describing his invention says:—“ First, with regard to my axles which may either be of wood or iron. I make their spindles, or ends round which the wheel and box rotates, of a conical form, and they may either have the widest end of the cone at the outer extremity of the spindle tapering inwards, or the cone may diminish from the middle of the spindle both ways; the former I call a single conical axle, the latter a double. A ring or shoulder may be fitted or cast around the inner end of the spindle; but this is not absolutely necessary. A spiral or longitudinal slot is cut along the spindle to allow the oil to lubricate it.

“ Next, with regard to my axle boxes. I form the box or casing to the spindle of either two or three pieces of metal; if of two pieces they are cast or formed symmetrical, and so as to have their inner surface of a similar form to

“ that of the spindle of the axle which they surround, having  
“ if necessary, flanges on their edges to bolt them together,  
“ and round the spindle, thus forming a complete box. If  
“ made of three parts, then two of the parts being symmetrical,  
“ and having their inner surfaces similar to the surface of the  
“ inner end of the spindle, are made to clasp the larger half  
“ of that end, their outer surface being so formed that when  
“ they encircle the inner end of the spindle they form with the  
“ other part a cylindrical surface, or a conical tapering  
“ outwards. Over these, that is over the outer end of the  
“ spindle which is uncovered, and the outer surface of the two  
“ symmetrical parts forming the box of the inner end, is put a  
“ hollow cylindrical cap or box, closed at the end ; the other  
“ end has two eyes cast upon it, corresponding to similar  
“ eyes or bolt holes in the other two parts, and through these  
“ the three are bolted together, so as to render it impossible  
“ for the axle to come out as long as the bolts stand. A hole  
“ is pierced in the outer end to allow oil or lubricating  
“ matter to pass to the spindle.

“ I form the nave of my wheels of a hollow cylindrical or  
“ square wrought or cast-iron box. At a short distance from  
“ each extremity is fixed a row of lugs, to which I firmly bind  
“ a metal disc or plate, between these two discs or plates the  
“ ends of the spoke are firmly bolted or fixed in sockets. On  
“ each extreme face of the foresaid box I fix another metal  
“ plate, having a perforation similar to that of the box, and  
“ of a smaller diameter than those previously mentioned ;  
“ the space between each is then enveloped with a covering  
“ of metal plate firmly secured. I form the rim or felloe of  
“ my wheel of segments of wood, in one, two, or more layers  
“ in thickness, laid so as to break joint ; these are encased  
“ on each side with similar segments of a metal plate or  
“ shield, having flanges on one side to grasp them firmly  
“ together ; or the said shields may have two or more  
“ grooves cut along their inner surfaces ; the whole are then  
“ bolted together. These metal shields may either be in one  
“ whole piece or composed of segments, and may be either of  
“ wrought or cast-iron. The outer periphery of the rim  
“ (and in some cases the inner) is bound with an iron tire,  
“ firmly bolted to the wooden segments. Instead of forming  
“ the felloe solid all round the wood, segments may be

“ inserted only at the places where the spokes enter the  
“ felloe ; in this case it would be advantageous to have the  
“ iron tire bound round the inside periphery as well as the  
“ outside. I form my spokes of wrought iron in one, two, or  
“ more pieces.”

[*Printed, 7d. Drawing.*]

A.D. 1856, October 2.—No. 2313.

CROFTON, MICHAEL THOMAS.—Passenger indicator. Two dials are fixed in the vehicle. One dial has three registering hands; the other has indicators registering tens, hundreds and, if necessary, thousands. There are also three bells and three levers, each corresponding with one of the three registering hands and each devoted to a fare of a particular amount. Thus when a passenger leaves the vehicle and has paid his fare, the conductor pulls the lever corresponding with the register of fares of the amount or class paid, which is accordingly noted on the dial.

[*Printed, 10d. Drawing.*]

A.D. 1856, October 11.—No. 2387.

LATHAM, JAMES.—(*Provisional protection only.*)—Passenger indicator. This apparatus is worked by means of the joint operation of a clock spring and a hinged step to the vehicle. When the latter is depressed, the spring works the indicator, and the depression of the step also keeps the spring wound up.

[*Printed, 5d. Drawing.*]

A.D. 1856, October 15.—No. 2413.

HAZELDINE, GEORGE.—Poles for carriages. “ This invention consists in the adaption of a peculiar ‘ pole ’ between  
“ the horses or draught animals, which ‘ pole,’ instead of  
“ being as now practised, so formed as to be secured by  
“ slipping the same into a socket, &c., is by this invention  
“ made either in two parts, the hind part being secured to  
“ the carriage, and the fore part jointed to the hind part, or  
“ the pole is jointed or hinged to the carriage, which is  
“ suitably formed and arranged for the purpose. A method  
“ by which this invention may be carried into effect is this:—

There are "two angle irons, one on each part of the pole, and  
 " one of which projects beyond its part, so as to underlay and  
 " support the other part of the pole, the ends of the pole  
 " being secured by a joint or hinge, which allows the fore  
 " part of the pole to be thrown up and secured from accident  
 " when not in use. When in use the two parts of the pole  
 " will be kept steady and fit for use by being secured by locking  
 " mechanism, as by a pin or bolt passing through the two  
 " parts and securing the same together."

An improved fore-carriage is shewn; "the improvement  
 " consists in dispensing with the two 'futchells' usually  
 " adopted and in having a stock piece for the pole to which a  
 " pole is to be jointed in the same manner as the fore part  
 " of the pole before described is jointed to the hind part."

[*Printed, 6d. Drawing.*]

A.D. 1856, October 20.—No. 2462.

DEACON, HENRY.—Suspending carriages. "This invention  
 " has for its object improvements in suspending carriage  
 " bodies. For these purposes, in place of using an ordinary  
 " perch, two side bars or braces are employed, one on either  
 " side of the carriage, and such bars or braces are curved  
 " or bent, so as to descend between the fore and hind  
 " wheels sufficiently to have a step formed or affixed to each  
 " of them; and it is preferred that the wings should also be  
 " fixed to such side bars or braces. The hinder ends of these  
 " bars or braces are affixed directly to the hinder axle, or by  
 " preference to a bar or frame which has springs between it  
 " and the hinder axle. The back of the body is suspended by  
 " means of two **C** springs, affixed to the hinder ends or the  
 " side bars or braces, or to the bar or frame which con-  
 " nects them. The fore ends of the two bars or braces  
 " are each fixed to a horizontal bar, by preference of  
 " wood, which is supported by two half elliptical springs,  
 " placed back to back, and secured to a frame which turns  
 " on the pin of the locking motion. The front of the  
 " body of the carriage is suspended to two **C** springs, the  
 " lower ends of which are attached to the bars which are  
 " fixed to the fore ends of the side bars or braces, and the  
 " springs rest on the central parts of the elliptical springs.  
 " The central parts of the elliptical and the **C** springs (on each

“ side) are retained in position by uprights fixed to the frame  
 “ carried by the locking motion. It may be remarked, that  
 “ the mode of arranging and combining the fore springs and  
 “ frame on the locking motion may be used with advantage  
 “ without the C springs and without the side bars or  
 “ braces.”

[*Printed, 6d. Drawing.*]

A.D. 1856, October 24.—No. 2503.

HOLDEN, HOWARD ASHTON.—Enamelling carriage furniture. The patentee says:—“ My improvements are applicable to  
 “ railway and other carriage door handles, as also handles  
 “ for other purposes, parts of carriage steps, shaft tips, pole  
 “ hooks, and crabs, breechen staples, draw bar, and carriage  
 “ lamp sockets, apron and elbow knobs, head joints, nail and  
 “ screw heads, and other interior carriage fittings, as well as  
 “ buckles for harness and other purposes, terretts, cock eyes ;  
 “ as well as certain parts of cart furniture, axletree boxes,  
 “ plates, and other ornaments applicable for various purposes.  
 “ And my improvements in the description of articles herein  
 “ enumerated consists in coating them with enamel of any  
 “ desired colour which will be found to wear better and look  
 “ cleaner than such description of articles generally do when  
 “ finished by the ordinary process, namely, that of plating  
 “ them with brass or silver, which is attended with considerable trouble and expense in keeping them clean.

“ I do not claim any novelty in the mode of enamelling but  
 “ simply that of applying the process to the finishing of such  
 “ articles hereinbefore described, duly observing to make  
 “ them of such a shape that all sharp angles and points may  
 “ be avoided, as in the process of firing the enamel is liable  
 “ to run off those parts and leave them bare.”

[*Printed, 7d. Drawing.*]

A.D. 1856, October 31.—No. 2561.

WORSSAM, SAMUEL, and GRIST, JOHN.—(*Provisional protection only.*)—Cutting and shaping spokes &c. The inventors describe so much of their improvements as relates to carriages, as follows:—“ In the forming or shaping of felloes for  
 “ wheels and such like curved surfaces we employ two band

“ saws, set at such a distance apart as is necessary for the  
“ depth of the article to be cut, and mount the blanks from  
“ which the articles are to be formed upon a revolving frame  
“ or platform, to which we communicate motion by toothed  
“ or other suitable gear. The band saws are carried over  
“ drums and work in the same place.” “ For cutting spokes  
“ and other like curved articles, we employ a lathe bed, in  
“ which the blank to be cut is fixed, and cause the bed to  
“ oscillate in the direction of its breadth, so as to offer  
“ different sides to a cutter made to travel in a line parallel  
“ with the oscillating bed ; or we employ a stationary bed and  
“ two cutters, one to travel over and the other under the  
“ wood, and make the cutters in such forms as will suit the  
“ curves to be given to the article to be formed. In the last  
“ named two cases, instead of the cutters travelling, the wood  
“ may be made to travel to them.”

*[Printed, 3d. No Drawings.]*

A.D. 1856, November 3.—No. 2578.

MIDDLETON, SAMUEL. — Whip sockets. This invention which relates to the treatment and manufacture of leather for a large variety of purposes, includes a method of making seamless whip sockets from the skins of the tails of sheep, calves, or pigs, the bottoms being made of metal or by inserting and fixing a piece of leather or other material.

*[Printed, 2s. 2d. Drawings.]*

A.D. 1856, November 13.—No. 2675.

HUTTON, ALEXANDER. — Carriage warmers. The patentee says, “ instead of the present plan of making a metal vessel to  
“ hold water and sinking the same into the floor of the  
“ carriage or otherwise, I make a bag or vessel of vulcanized  
“ india-rubber, waterproof cloth, or any other suitable ma-  
“ terial capable of containing water or other fluid at a  
“ temperature of 212 degrees Fahrenheit, and of sustaining  
“ a pressure of about 15 lbs. per square inch or upwards. I  
“ make this bag or vessel closed at one end, and at the other  
“ end I fix a tap or valve with a screw plug or other con-  
“ venient contrivance, through which valve I pass hot water,  
“ hot sand, or any other heating substance or fluid, and

“ when the bag or vessel is full I secure the tap or valve with  
 “ the screw plug already referred to. The bag or vessel thus  
 “ filled I enclose in a casing or covering made of cloth or  
 “ any other suitable material; or the said casing may be  
 “ made partly of wood or metal and partly of cloth, the  
 “ apparatus so prepared serving both as a warmer and a  
 “ footstool, and if the passengers do not require it for either  
 “ of the said purposes it can be easily removed.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, November 14.—No. 2686.

EMERY, RICHARD.—Springs. This invention consists “ in  
 “ constructing of all kinds of metallic springs, commonly  
 “ called leaf springs, by placing between each leaf or steel a  
 “ thin plate of metal, either of zinc, tin, copper, or a com-  
 “ pound metal formed of two or more of the above mentioned  
 “ metals. Each intervening metal to be secured at the centre  
 “ of the spring in the ordinary way by what is technically  
 “ called the ‘clip’ and also to have the necessary arrange-  
 “ ment to allow free longitudinal play, and also slots and  
 “ pins to prevent lateral play, so that when there be a  
 “ deflection of the spring the motion between the leaves is kept  
 “ perfect. The object of these before mentioned leaves of  
 “ compound or simple metals intervening between the steel  
 “ plates is to prevent the corrosion of the steel. There is a  
 “ partial galvanic action kept up by the action of the two  
 “ metals throwing off ‘origen’ (oxygen) from the steel,  
 “ thereby preventing corrosion and ensuring at all times  
 “ a free action between the leaves.”

[*Printed, 6d. Drawing.*]

A.D. 1856, November 14,—No. 2687.

EMERY, RICHARD.—Axles and boxes. The patentee says, “ my  
 “ invention consists, in so constructing the axles and boxes of  
 “ a common carriage that there be a bearing parallel to the  
 “ axis on both ends of the box, but that the inner bearing be  
 “ of larger diameter than the outer bearing. Each of those  
 “ bearings are composed of a composition metal differing  
 “ from that of which the box itself be made, and are composed  
 “ either of gun metal, or simple tin, or any other composi-

“tion of tin, bismuth, and antimony, or any of the known compositions known by the name of antifricition metals. Out of either of the above compounds or simple metals I form collars or bushings, and shrink or screw them into each end of the axle box, the ends of such bushings to be sufficiently large to allow a collar on both ends of the axle to play and wear against, so as to receive all lateral shocks given by the irregularities in the road to the wheels. The axle being taper from the larger to the smaller bearing, although the bearings are parallel to the axis, yet there is a space between the axle and box to hold oil for lubricating both the bearings and collars. What I claim is, the bushing of the axle box at both ends, in the form and manner above described, with either the simple or compound metals in connection with the two parallel bearings and collars, as described.”

[*Printed, 5d. Drawing.*]

A.D. 1856, November 18.—No. 2719.

WILSON, JOHN.—Springs. This invention “consists, firstly, in making springs for carriages of steel, having a curved or convex figure in its cross section instead of the flat steel ordinarily employed.

“Secondly, in making springs for carriages from steel which, besides having the curvature already described, has a convex curvature running at right angles to the former curvature.

“Thirdly, in a new spring for road carriages without a perch. This spring is of the ordinary form, but its ends are connected in the following manner:—Connecting rods or links jointed to the ends of the spring approach each other nearly in the same line, and are jointed to a rod nearly at right angles to the said links. The body of the vehicle is supported on the last-named rod.”

Although it is preferred to make the steel used in carrying into effect the first and second parts of the invention of the curved figures described, yet “the figure of a semi-polygon may be employed with the same or nearly the same effect.”

[*Printed, 7d. Drawing.*]



A.D. 1856, December 1.—No. 2834.

GILKS, CHARLES HENRY.—(*Provisional protection only.*)—Umbrella stand for carriages. The inventor says:—"My invention consists in the use of a stand or vessel for retaining wet umbrellas, so constructed as readily to be attached to a railway or other carriage door without encroaching on the space allotted to passengers. To the door of the vehicle I apply two studs or other fastenings, and the stand is slotted so as to fit on to these studs. The sides of the stand are bevilled off so as not to incommode passengers, and the stand is made of galvanized iron or other suitable material, perforated at the bottom, and communicating with an outlet from the carriage for the dripping from the umbrellas."

[*Printed, 3d. No Drawings.*]

A.D. 1856, December 6.—No. 2893.

HOOPER, WILLIAM, FRY, JOSEPH, and NASMYTH, GEORGE.—Springs. "This invention" according to the patentees "relates to the application of vulcanized india-rubber in a novel and peculiar manner. We take tubes of vulcanized india-rubber of a suitable diameter and thickness, or we take sections of tubes or of cylinders or rings, either of circular, square, or other section, or we take balls or spheres, and we apply them either singly or in combination, in such a manner that the elasticity is produced by the compression of the cylinders, tubes, balls, or rings in the direction of its or of their diameter, and where several balls, tubes, or cylinders are combined, the variation of the position of the parts of the several rings or other forms, or of the extent of their surfaces in contact, will give varying or increasing degrees of resistance and of elasticity. These springs are fitted into cases, or confined between side plates or cheeks. Such forms of vulcanized india-rubber articles as herein described may be applied for the bearing, drawing, or buffing springs of railway carriages, and for other purposes."

[*Printed, 10d. Drawing.*]

A.D. 1856, December 8.—No. 2905.

EATON, RICHARD. — India-rubber springs. The principle of this invention, of which a number of varied forms of application are shown, consists in [the use of thin sheets of india-rubber in combination with metal. “It is preferred” says the patentee “that the sheets of india-rubber used “ should not exceed a quarter of an inch in thickness, and in “ making up a spring several thicknesses of india-rubber are “ used together with sheets of metal or thicknesses of metal. “ This invention is founded on a peculiar property which ” the patentee claims to have discovered in vulcanized india-rubber, namely that this substance is more effective for spring purposes when divided into sheets of less thickness than half an inch than when used in one piece.

[*Printed, 10d. Drawing.*]

A.D. 1856, December 11.—No. 2947.

CAMBRIDGE, WILLIAM COLBORNE.—Portable railway. In carrying out this invention there is adapted “to each wheel “ a set of plates or sustaining pieces, made flat on their under “ face, which severally receive in turn the pressure of the “ wheel as it revolves. These sustaining pieces are con- “ nected together by being jointed to a double set of levers, “ which act as links, and bind all the parts together into an “ endless railway. At about the middle of the length of the “ sustaining pieces, and at either side thereof lugs are “ formed to receive the junction pins of the levers or links, “ and they also act as guides between which the wheel runs. “ The sustaining pieces are provided with bearing rails to “ receive the pressure of the periphery of the wheel, and “ being thus supported at the middle of their length, they “ are severally free to take up a horizontal position, or adjust “ themselves to the irregularities of the road or way, before “ the pressure of the running wheel comes upon them ; thus “ the action is rendered smooth, and no unnecessary strain or “ wear is put up on any parts forming the portable railway.”

[*Printed, 5d. Drawing.*]

A.D. 1856, December 22.—No. 3025.

LANG, LOUIS ANTOINE.—(*Provisional protection only.*)—Supporting vehicles on wheels. The following is the inventor's

provisional specification :—“ Instead of supporting the frame  
 “ or body of the vehicle upon the axle or in the centre of the  
 “ wheel, as is generally done, I cause it by my arrangement to  
 “ rest upon the exterior part of the nave of the wheel, between  
 “ the spokes and the frame or body of the vehicle. To effect  
 “ this object more readily it is desirable to make the naves  
 “ of wheels larger and stronger than usual; they should also  
 “ be furnished with a strong cylindrical hoop or band of  
 “ iron, or other material, which may be plain, toothed, or  
 “ notched, and provided with a flange or projection at each  
 “ end. The frame or body of the vehicle is furnished under-  
 “ neath on both sides with a strong box or bracket of iron,  
 “ or other suitable material, into which is fitted a roller or  
 “ pinion, plain, toothed, or notched, corresponding with the  
 “ hoop or band on the said nave, and having a strong spindle  
 “ of hardened steel or other material affixed to or passing  
 “ through its centre, so as to constitute an axis on which or  
 “ with which the said roller or pinion can rotate freely within  
 “ the said box or bracket. The frame or body of the vehicle  
 “ will thus rest upon the axis of the roller or pinion, the  
 “ periphery of which will rest upon the periphery of the hoop  
 “ or band attached to and surrounding the nave of the wheel.  
 “ The slightest motion either backwards or forwards to  
 “ rotate the wheel will also rotate the roller or pinion, but  
 “ the amount of friction will be very much reduced. The  
 “ box or bracket containing the roller may, if desirable, be  
 “ affixed either perpendicular or with a slight obliquity to  
 “ the said nave. The spindle or axis of the said roller or  
 “ pinion may be furnished with a finger or catch, so contrived  
 “ and arranged as when required to fall into the toothed nave  
 “ or a ratchet affixed thereto; or a ‘ break ’ may be applied on  
 “ both roller and nave so as to lock them, and thus stop or  
 “ retard the vehicle.

“ My invention is applicable to all kinds of vehicles whether  
 “ worked by manual, horse, steam, or other power.”

[*Printed, 3d. No Drawings.*]

A.D. 1856, December 31.—No. 3102.

BRAY, WILLIAM.—Traction engine wheels. According to  
 the patentee, “ the wheels of traction engines adapted for  
 “ ploughing, dragging weights over soft ground have not

“ sufficient hold upon the ground if constructed in the ordinary manner. By my improvements I construct the wheels with teeth or blades which enter the ground and obtain a firm hold. These teeth are made to slide or move in and out by an eccentric or other mechanical means, so that they clear themselves of the soil and are again ready to enter the ground. The eccentric is capable of adjustment, so that the projection of the teeth may be varied, and thus the wheel may at pleasure be made to act like an ordinary wheel. This adjustment enables the wheels to run well upon hard ground when required.”

[*Printed, 10d. Drawing.*]

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1857.

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A.D. 1857, January 1.—No. 7.

MABERLY, FREDERICK HERBERT. — Improvements in carriages. The invention consists, firstly, in suspending vehicles upon their wheels in such a way that they are brought nearer to the ground, thereby affording easier access to them, and allowing a roof to be placed over the outside seats. The wheels may be arranged within the framing, so as to be out of the way. The outsides of the framing are then protected by wooden pieces plated with iron.

Secondly, in covering outside seats by waterproof roller blinds placed at an angle to throw off the water, and in making removeable covers for carriages so that such carriage may be open or closed at pleasure.

Thirdly, in an arrangement of spiral springs.

Fourthly, in a method of mounting a two-wheeled cab upon its axle “ by means of a barrow spring, and a superadded spiral one, by which ” means “ the carriage may be placed backwards or forward with the driver’s seat in front, and the doors to the same opened either before the wheels or behind them, or at the back ” when short or divided axles are used.

Fifthly, in a hinged joint for doors, so packed that the danger of jamming fingers is removed.

The specification also describes arrangements of fore carriage and wheel guards.

[*Printed, 7d. Drawing.*]

A.D. 1857, January 6.—No. 44.

DUMARCHEY, FRANÇOIS FRÉDÉRIC, LEVY, SAMUEL, and MAYER, JOSEPH.—Wheels and axles. “These improvements consist in keying or otherwise coupling the two wheels of each axle to the journals of this latter, and having the axle formed in two or more parts, in such manner as to allow of each wheel having a distinct motion, independant of the others; to each axle are solidly fixed two or more collars, forming a projecting ring round the same, each collar turning in corresponding bearings fixed to the carriage. Round the nave of each wheel is fixed a collar, the outer rim of which is concave, and thus forms a groove, in which is adapted and turns a ring, furnished with projecting arms, in a manner similar to the spokes of a wheel; and over to the other extremity of these projecting arms or radii is fixed a broad hoop or tyre, of sufficient width to extend over the tyre of the wheel of the carriage, the inner surface of the said hoop being provided with a projecting rim, against which glides the flange with which the tyre of the wheel is provided, the said hoop serving consequently as a circular revolving rail, kept constantly interposed between the wheel of the carriage and the surface of the ground over which the carriage is moved. Both extremities of the said hoop may be turned up at right angles and made to enclose the wheel entirely, and thus preventing any dirt being projected against the latter.”

[*Printed, 7d. Drawing.*]

A.D. 1857, January 10.—No. 86.

KYLE, DAVID DUNNE.—Brakes. This invention consists in applying the weight of the vehicle itself as a counteracting force to the motion of the wheels. For this purpose various arrangements are mentioned having for their end the transfer of the load from the wheel axle so the periphery of the wheels through the intervention of brake or friction rollers, or concave

blocks, or both. The use of these "secondary wheels," as they are called, is "the main feature of the invention."

[*Printed, 7d. Drawing.*]

A.D. 1857, January 28.—No. 248.

COOKE, THOMAS.—Ventilators for omnibuses. Openings are made in the roof of the omnibus underneath the roof seat. These openings are covered by hinged flaps placed longitudinally. They incline each way towards the sides when closed; when open they are horizontal and immediately under the seat. They are opened and closed by means of vertical screwed rods supported on columns and caused to move up and down by means of pinions on screw nuts running thereon. These pinions are in their turn, worked by racks drawn or pressed by the conductor by means of a winch.

[*Printed, 10d. Drawing.*]

A.D. 1857, February 10.—No. 384.

HODGES, WILLIAM RICHELIEU.—(*Provisional protection only.*)—Elastic material. The following is the inventor's provisional specification:—"I take two elastic materials and unite " or cement their surfaces with a solution of caouchouc, or a " composition of caouchouc and other similar waterproof " substance, by which I produce an elastic material perfectly " waterproof, and resembling cloth or woven fabrics. This " waterproof material is applicable to most kinds of wearing " apparel, as boots, shoes, hats, coats, &c., to belts, sadlery, " cushions, lining for carriages, and in fact to all purposes " where an elastic material is desirable."

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 12.—No. 409.

ADAMS, WILLIAM BRIDGES.—(*Provisional protection only.*)—Windows for carriages, &c. This application relates to improvements in the construction of buildings and comprises among them a method of making windows by placing two plates of glass in one frame so as to leave a space between them. This system of construction is intended to obviate radiation and thereby increase warmth. It is claimed in its application to carriages.

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 20.—No. 497.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—(*Provisional protection only.*)—Steam digging machinery. This invention relates to improvements on No. 1152, A.D. 1853. The improvements consist:—

“ First, in placing the large motive or running wheels behind the furnace for the better adjustment of the weight.

“ Second, in forming the wheels with a sheet iron felloe, bolted or rivetted to flat or T iron spokes, shaped like a truncated isosceles triangle converging to and supported by the nave.

“ Third, in dividing the nave of the large wheels into two parts, so that the wheels may slightly incline on the axle.

“ Fourth, in leaving a certain amount of play between the nave and the axle.

“ Fifth, in substituting for the chain wheels used for throwing the motive or running wheels out of gear, an arrangement of coupling or clutches, forks and levers, allowing the axle to turn freely in its bearings, and attaching it by couplings or clutches to the running wheels, in such manner that one wheel might be thrown out of gear without stopping of the revolution the axle.

“ Sixth, in modifying the arrangement of gearing for driving the fore-carriage wheels simultaneously with the large motive or running wheels, by employing bevil wheels mounted on a shaft gearing into other and corresponding bevil wheels, placing a chain wheel on the centre of the axle, and providing chain wheels supported by couplings or cotters.

“ Seventh, in placing shoes, skids, or guards on the peripheries of the motive wheels.

“ Eighth, in so arranging the axle of the fore carriage that it may follow the undulations of the soil, and which is done by surrounding the axle by clutches, against which press springs connected to a shaft with pins or studs carrying a beam, which is bolted to stays or bars fitted under the lower platform.

“ Ninth, in employing steam to tilt or incline the fore-carriage in working a curve or turning the machine.”

The improvements consist in addition of eleven other matters not within the scope of this series.

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 20.—No. 503.

ALDEBERT, ISAAC.—(*Provisional protection only.*)—Shackle for springs. It consists in “binding a piece of vulcanized “ india rubber, with a piece, strip, or band of metal of suitable form and strength for retaining it in its proper shape, “ and preventing the elongation. The metallic piece or “ band being narrower than the rubber, cuts off the communication of sound between the bottom or lower part of “ the spring and the upper or top half, and the bolts only “ passing through the rubber prevents the vibration being “ communicated to the body of the carriage, and stops at once “ the humming sound so much complained of.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 21.—No. 515.

WILLIAMS, JOHN.—(*Provisional protection only.*)—Improved carriage. This carriage resembles in some respects a dog cart. The front and back seats are capable of being slid apart or brought near to each other, and they may be so placed that the passengers may sit *vis-a-vis*. By removing the seats, the vehicle may be used as an ambulance. The backs of the seats are hinged and may be made to slope more or less. The seats and other moveable parts are held in place by pins. The shafts are made to accommodate horses of varying heights. For this purpose they are made in halves. The half fixed to the carriage has a socket in which other interchangeable and differently shaped parts may be introduced.

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 27.—No. 574.

DAVIES, DAVID. — Step. “This improvement, which is “ particularly applicable to broughams and other single-step “ carriages, consists in placing the step upon an arm or “ bracket, which turns upon a central pin or axis when acted “ upon by a connecting link attached to the carriage door. “ This connecting link is pivoted at one end to the door of



“ the carriage, and at the other end to a point in the step  
 “ eccentric to the axis on which it turns, so that when the  
 “ carriage door is shut the step lies beneath the body of the  
 “ carriage, front inwards, but in opening the door the connecting link draws the step half round, and causes it to project in front of the doorway ready for use. The closing of the door returns the step to its original position beneath the carriage.”

[*Printed, 5d. Drawing.*]

A.D. 1857, February 28.—No. 586.

DURANT, ANGUISH HONOUR AUGUSTUS.—(*Provisional protection only.*)—Passenger indicator. This invention relates in part to improvements upon the apparatus described by the same inventor under his patent, No. 2038 of A.D. 1855, and consists in adding a bell and other apparatus for registering the gross number of persons carried. One bell only is used and that corresponds with the highest fare charged. If a lower fare be paid the conductor must indicate the fact by moving a lever, or submit to be charged himself with the difference. This apparatus may be connected with the step, so as to be self-acting. There is also a self-registering indicator.

[*Printed, 3d. No Drawings.*]

A.D. 1857, March 3.—No. 618.

BROAD, JAMES.—(*Provisional protection only.*)—“ The application of artificial boards or papier machee, or patent composition boards composed (or partly so) of any vegetable fibre, and the like either in its raw state or worked up from old substances, to friction washers of every description of wheeled carriage and cart axles; also, for covering wing and dash irons, and forming heel boards for hansom cabs.”

The “ invention consists in the adaptation of patent composition boards, manufactured from hemp, flax, old ropes, rags, straw, hop bines, bark of trees and all vegetable fibres, either in their raw state or worked up from old substances, as substitutes for leather for the before-recited articles.

“The apparatus” used “for forming or cutting the above mentioned materials into the above enumerated articles consists of an ordinary washer cutter, composed of a steel shaft and a knife thereto affixed, which on the revolution of the shaft cuts out the washers.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, March 6.—No. 658.

FINDLATER, WILLIAM, and KEETLEY, WILLIAM.—(*Provisional protection only.*)—Locking carriage wheels. This invention relates to a method of arranging the fore wheels, whereby larger wheels may be used, and they may also be brought nearer to the hind wheels. It “may be applied to any kind of carriage.” The inventors say, “we carry our invention into effect by making the top and bottom transum plates to a circle as wide as or wider than the boot of the carriage, the top plate slotted in the sides and part of the hind cross plates with curved slots; four bolts, two on each side, are shouldered in square in the bottom plate, with turned necks to work in the slots of the top plate. The movement is as follows:—In turning round to the offside the near side wheel runs forward, both the bolts of that side running along the near side slots of transum wheel, and the hind bolt of the off side runs along the parallel slot of the hind bar; the first bolt being over the axle acts as a fulcrum, and the off side wheel, instead of running back, merely turns on its own axis, and the reverse when turning round to the near side.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, March 7.—No. 665.

PARKES, JOSIAH.—“An improved apparatus for locomotive purposes.”

“This invention consists in an apparatus which acts as a substitute for an ordinary wheel, where a great burden has to be supported upon soft ground, or where great frictional contact is required for tractile or locomotive purposes on either yielding or comparatively unyielding surfaces.

“The apparatus consists in a number of feet, clogs, or pattens, each having two axes, one on each side. These axes are supported in bearings, which are all at a corre-

“ sponding distance from a common centre, round which  
“ they work, and at the same distance from each other.  
“ When the vehicle is set in motion each foot comes to the  
“ ground, and rises therefrom in a position parallel to the  
“ surface of the ground, which it retains throughout its  
“ passage round the main axle.”

[*Printed, 10d. Drawing.*]

A.D. 1857, March 18.—No. 765.

ANDERSON, SIR JAMES CALEB.—(*Provisional protection only.*)  
—“ Improvements in locomotive and other carriages.”

The invention consists, firstly, in fitting a steam chamber to the top of the boiler, so that the latter may be kept filled and so obviate uncovered tubes and fire box in ascending hills.

Secondly, in causing the wheels of different kinds of vehicles to run inside larger wheels, which thus serve as portable roads or railways, and which may be grooved, fitted with rails, or cogged as occasion may require.

Thirdly, in making exhaust steam transparent by mixing it with a blast of hot air; and

Fourthly, in placing the engineer, with the starting gear in front of the engine so as to afford him a clear view. The fireman has a place at the back of the engine.

[*Printed, 3d. No Drawings.*]

A.D. 1857, March 31.—No. 883.

QUINCHE, ANTOINE JOSEPH.—Numerator or indicator for carriages.

This indicator determines, firstly, the whole distance travelled during the day; secondly, the value or estimate, a matter of previous arrangement of the number of miles which the vehicle might have run in cases where it remains stationary while engaged; thirdly, every fresh hire of the vehicle, an indication necessary when the first mile is charged at a higher rate; fourthly, it gives a notice to the passenger that the mileage indicator by which he will have to pay, has returned to its regular point of starting; and fifthly, affords an external indication of the carriage being disengaged.

[*Printed, 10d. Drawing.*]

A.D. 1857, March 31.—No. 893.

DURANT, ANGUISH HONOUR AUGUSTUS.—(*Provisional protection only.*)—Omnibuses. According to this provisional specification, the invention consists, “Firstly, in an improved  
“ mode of applying a drag to an omnibus.

“Secondly, in affording more space between the seats in  
“ omnibuses than heretofore, without increasing the width  
“ of the omnibus for that purpose.

“Thirdly, in an improved method of establishing a communication between the conductor and the passengers that  
“ are inside the omnibus.

“Fourthly, in the use and adaptation to omnibuses of  
“ three wheels in combination with double doors and a drag  
“ operating upon the hindermost of the aforesaid three  
“ wheels, or upon any one or more of four wheels in any  
“ convenient and suitable manner.

“Fifthly, in the application of gutta percha or elastic  
“ material to various parts of omnibuses to prevent noises at  
“ such parts.

“As regards the first part of this invention, the improvement is proposed to be effected by causing the pole of an  
“ omnibus to operate upon the drag in conjunction with  
“ certain mechanism which the coachman operates upon so  
“ as either to lock the pole and prevent it from acting upon  
“ the drag or to release it from acting thereon.

“As regards the second part of this invention, the improvement is proposed to be effected by lowering the back edge  
“ of each seat and raising the front thereof, so as to incline  
“ it at an angle to the horizon of about 20 degrees, more or  
“ less, thus rendering the seats of omnibuses more comfortable to the passengers than the seats as heretofore constructed, at the same time affording more space up the  
“ centre of the omnibus and from the seat to the top of the  
“ omnibus for the heads of passengers.

“As regards the third part of this invention, the improvement is proposed to be effected by means of a hammer in  
“ connection with a main wire extending from the inside to  
“ the outside of the omnibus, instead of by means of a bell  
“ as heretofore practised.

“As regards the fourth and fifth parts of this invention,

“ the improvements are proposed to be effected as before  
“ stated under these heads. The above improvements when  
“ applied to omnibuses I propose to call the liberator.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, April 2.—No. 915.

HOLDEN, HOWARD ASHTON.—(*Provisional protection only.*)—Carriage lamps, furniture, &c. This invention consists, firstly, in making the parts of lamps, now usually constructed of plated copper, of zinc plated with silver or other metal. For the tops and other parts much exposed to heat, block tin is used instead of zinc.

Secondly, in substituting zinc for copper and copper alloys in carriage fittings, such parts being electro-plated if desired. Handles, hinges, beading and other articles are named as capable of being so made.

[*Printed, 3d. No Drawings.*]

A.D. 1857, April 13.—No. 1043.

BEAUMISNIL, PIERRE VICTOR, and ERHARD, CHARLES.—(*Provisional protection only.*)—Wheels. “ This invention has for  
“ its object improvements in wheels for railway and other car-  
“ riages. For this purpose, in place of making the spokes of  
“ wheels in one piece from the nave to the felloe, as heretofore,  
“ each of the spokes is made in two parts, one part being fixed  
“ to the felloe and the other to the nave, and the two parts  
“ being connected together by a pin on one of the parts passing  
“ through a slot formed in the other part. By this means it  
“ will be seen that the axle will always be below the centre of  
“ the wheel. The parts of the spokes fixed to the felloe are  
“ made in two sets, between which the parts of the spokes  
“ fixed to the nave pass ; and their ends are held securely by  
“ being fastened to rings, the inside of the rings being suffi-  
“ ciently large to admit of the movement of the nave ; and  
“ the two sets of the parts of spokes fixed to the felloe are  
“ held together by means of the pins, which pass through  
“ the slots in the other parts of the spokes. Or, in place of  
“ having spokes fixed to the felloe, two discs may be em-  
“ ployed, the spokes fixed to the nave working between them,  
“ the two discs being held together by means of the pins

“ which pass through the slots in the other spokes; and a  
“ hole being left in the centre of the discs for the movement  
“ of the nave.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, April 16.—No. 1073.

RAGGETT, GEORGE.—(*A communication.*)—(*Provisional protection only.*)—Brake. This invention is described in its application to railway purposes, but the inventor claims also its use for common road purposes.

According to the description brake blocks are mounted directly over the wheels of a railway carriage, each brake being connected with the centre of a curved spring which extends over it, and for some distance beyond it on each side, the ends of this spring either being slotted to receive bolts which are secured to the carriage frame, or a “lip” being turned at each end of the spring, and connected with a strap or staple in the frame, the spring when at liberty keeping the brake raised, so as to be free from the wheel, but allowing it to be depressed when necessary into contact therewith. Each spring carries on its central part a bearing suitable for a “rock shaft,” each shaft passing across the frame of the carriage, and having upon it collars which are provided with hooks, a chain passing from each hook to the axle box, or some other convenient part of the vehicle to which it is attached. The result of this arrangement is, that on the rock shaft being turned in one direction the chains are coiled upon it, and the springs with the brake blocks are forced downwards, bringing the latter into contact with the wheels, while on the shaft being turned in the other direction, the chains are unwound therefrom, and the springs again raise the brakes out of action. The movement of the rock shaft is produced by means of levers fixed or formed thereon, and connected together by horizontal rods, the whole being operated through the medium of a chain and a vertical shaft turned by hand.

[*Printed, 9d. Drawings.*]

A.D. 1857, April 16.—No. 1078.

SCOWEN, THOMAS LAYZELL.—Canopy for carriages, &c. “It  
“ consists of jointed standards, attached or not, or to fit in

“ sockets (according to discretion) to the carriages, boats,  
 “ and places intended for its reception, on which the frame-  
 “ work of canopy, consisting of a centre rail of wood or iron,  
 “ or both combined, is attached and supported, and to this  
 “ centre rail are attached ribs, which expand according to the  
 “ shape of the canopy.

“ The framework when collapsed and let down with the  
 “ jointed attached standards will form a back rail to a double  
 “ seat, such as seats on roofs of omnibuses, or seats on boats,  
 “ &c., and can be raised up and horizontally expanded over  
 “ the entire roof or place intended to be covered, with little  
 “ or no inconvenience to the passengers.

“ By means of the horizontal fin action the canopy can be  
 “ made to any shape required, and expanded or collapsed at  
 “ pleasure by the use of screws, levers, springs, and cords,  
 “ or by the hand without either screws, springs, or cords.”

[*Printed, 10d. Drawings.*]

A.D. 1857, April 16.—No. 1079.

SHERWOOD, ISAAC, and WAYNE, JOSEPH BLOUNT.—(*Provisional protection only.*) — Passenger indicator. This invention “consists in fixing upon the back of the nave of one  
 “ or more of the wheels of a vehicle, such for instance as a  
 “ hansom cab, a small worm wheel, so that by means of the  
 “ apparatus, herein-after described,” there can be obtained  
 “ by the revolution of the wheels a power working through a  
 “ system of wheels, a disc or dial, upon which disc a pointer  
 “ or pencil can be made to mark certain lines or points that  
 “ will indicate the distance a passenger may have travelled.  
 “ The working parts of the apparatus, when applied to a  
 “ hansom cab, are chiefly contained in the boot under the  
 “ driver’s seat, and under the passenger’s seat is a spring  
 “ operating when a person sits down upon a pencil or marker  
 “ in the boot, lowering such pencil or marker on to a circular  
 “ sheet of paper or pasteboard temporarily fixed upon the  
 “ disc before named; this disc is caused to revolve horizontally, as before stated, and by the following means the  
 “ worm wheel upon the nave of the running wheel drives a  
 “ small pinion fixed upon a rod running back parallel to the  
 “ side of the cab into the boot; the bend at the point where

“ it enters the boot is formed of coiled spring or gutta  
 “ percha, as a ready means of communicating the motion  
 “ through the said bend. The spring then joins a screw or  
 “ wormed shaft which drives a pinion on a second wormed  
 “ shaft at right angles to the first, and this second shaft  
 “ imparts the motion to a toothed wheel fixed upon the up-  
 “ right axis on which the disc is mounted. The papers to  
 “ be fixed upon the disc are divided out into segments, the  
 “ space between each line being regulated to indicate any  
 “ required distance, such as a mile, so that when the pointer  
 “ or pencil has marked from one radial line to another a mile  
 “ has been travelled.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, April 16.—No. 1086.

DE FONTAINEMOREAU, PETER ARMAND le Comte.—(*A communication.*)—Truck for heavy bodies. “ This invention  
 “ consists in the peculiar construction of an adjustable rolling  
 “ truck for moving and transposing stones and other heavy  
 “ bodies.

“ The truck is composed of two or more rollers in the form  
 “ of a double truncated cone, each roller being fixed to a  
 “ longitudinal axis, which works in bearings on a strong  
 “ frame. The bearings of each conical roller are held to-  
 “ gether by strong connecting iron or wooden pieces of a  
 “ suitable length. Upon these two pieces, forming the frame  
 “ of each roller, the stone or other heavy body is placed.  
 “ The axis of each roller extends beyond the bearings of the  
 “ frame, to allow the two racks to be placed upon them.

“ One end of each rack is formed with a number of teeth,  
 “ which fit upon the axis of one of the frames, thus connect-  
 “ ing the two conical rollers together, and adjusting the  
 “ required distance from each other.”

[*Printed, 8d. Drawing.*]

A.D. 1857, April 20.—No. 1105.

SANDERSON, THOMAS.—Two wheeled carriages. The in-  
 vention consists in causing the body of the carriage to rest  
 upon the springs instead of upon the shafts. The springs  
 rest, in their turn, upon the shafts or the axles, the shafts in



the latter case being secured to the axles. By this arrangement the pull on the carriage is transferred through the springs, instead of being directly exercised upon the body.

[*Printed, 5d. Drawing.*]

A.D. 1857, April 25.—No. 1178.

OLDERSHAW, AUGUSTUS PIGGOTT.—(*Provisional protection only.*)—Skidding wheels. “For this purpose the drag chain connected to the shoe or skid is arranged in such manner as to be taken up or shortened when used for holding or retaining the shoe under the wheel, and also in such manner as to be readily lengthened when it is desired to release the skid or shoe, and to allow the wheel to pass over it. The drag chain is made with a long link attached to one of the other links of the chain, such long link has a ring and a tongue. In order to shorten the drag chain the long link is passed through another link at a distance, and the same is held secure by the ring tongue, and in order to release the skid or chain a strap or cord is attached to the ring, on pulling which the ring is moved, the tongue is released, and the chain lengthens so as to allow of the wheel passing over the skid or shoe, and the same may be picked up or suspended by means of the chain or cord attached to the ring.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, April 29.—No. 1205.

CURTIS, WILLIAM JOSEPH.—(*Provisional protection only.*)—Ladder for omnibuses. “This invention has for its object improvements in apparatus to facilitate passengers ascending to and descending from the roofs of omnibuses. For these purposes a ladder is applied to the back or other suitable part of an omnibus, in such manner that it may, when out of use, be attached to the hinder part of the omnibus in an upright position, the lower end being off the ground; but when about to be used, by a very slight effort of the conductor, the ladder is caused to assume an inclined position, when the lower end thereof comes to the ground. The ladder is attached to the upper part of the roof by two

“ slots or suitable instruments to admit of the upper part of  
“ the ladder rising and falling, and yet be retained connected  
“ to the omnibus; and there are two radius rods or links  
“ lower down the ladder, which being pin jointed to the  
“ sides of the ladder and to the omnibus, control the distance  
“ which the lower end of the ladder is allowed to project  
“ from the omnibus.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, May 11.—No. 1329.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—(*Provisional protection only.*)—“ Locomotive apparatus for rail  
“ and ordinary roads.”

“ This improved locomotive apparatus consists of a carriage  
“ carrying its own endless railway in the shape of two large  
“ wheels, one on each side of the carriage. The wheels are  
“ formed with a groove on the inside, and across the groove  
“ there are fitted at regular distances projections or bars, so  
“ as to form an endless circular rack. The carriage is sup-  
“ ported at bottom upon two rollers or wheels, which travel  
“ each in the groove in the endless railway. Two other  
“ rollers working in the groove in the upper part of each  
“ endless rail maintain the carriage in position at top. The  
“ propelling power is imparted through a wheel on each side  
“ of the carriage, fitted with teeth or cogs, which take into  
“ the spaces in the endless rack. These toothed wheels are  
“ placed behind the supporting rollers, and are caused to  
“ rotate by a shaft driven by a steam engine or other prime  
“ mover. The shaft is fitted with disengaging apparatus,  
“ and carries three sets of gear wheels, whereby the speed at  
“ which the toothed wheels are driven can be modified. By  
“ means of a screw arrangement the weight of the carriage  
“ may be thrown forward or backward upon the rails to suit  
“ any rise or fall in the road.

“ The wheels forming the endless railway might be fitted  
“ with spokes or arms, uniting in a central boss or nave;  
“ then the fellies would be broader on one side, and would  
“ be provided with the circular rack and groove for receiving  
“ the driven toothed wheels and supporting rollers.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, May 14.—No. 1367.

READING, DANIEL.—Springs. This invention, “which has  
“ for its object to simplify the general form and construction  
“ of bearing springs for vehicles of all descriptions, consists  
“ in the employment of one or more spiral springs placed  
“ within cylindrical or tubular chambers corresponding in  
“ number and size to the spring or springs employed, each  
“ tubular chamber being fitted with metallic plungers or  
“ pistons in connection with the body of the carriage or  
“ otherwise, so as to maintain the springs in a vertical  
“ position, and supply the requisite reaction.”

[*Printed, 6d. Drawing.*]

A.D. 1857, May 14.—No. 1369.

BARTHOLOMEW, CHARLES, and HEPTINSTALL, JOHN.—  
“Improvements in machinery for rolling tyres and hoops for  
“ railway and other wheels ; and also other articles made of  
“ iron and steel.”

In this invention machinery is used which is so combined that “a ring of iron or steel may be expanded or contracted  
“ in diameter, and according to the form of rollers used so  
“ will be the section of metal produced.” On a suitable axis are formed two rollers, this axis turning in suitable bearings, and being driven by steam or other power. This axis is geared with and drives another axis which is parallel to it, and also furnished with rollers, the bearings of this axis being moveable towards or from those of the first-mentioned axis, in order that as the metal of the ring which is introduced between the rollers of one axis and those of the other is reduced in thickness the rolling surfaces may be brought nearer together. “One pair of these rolling surfaces are  
“ intended to act on the massive ring of metal to bring it  
“ roughly into the sectional form desired, whilst the other  
“ pair of rolling surfaces on these axes are made suitable for  
“ giving to the metal the finished sectional form desired,” and the finishing rolls “are combined in their action with  
“ three or more other rollers which act on the exterior of the  
“ ring of metal, and the surfaces of such three or more rolls  
“ are made to correspond with the figure of the exterior  
“ surface of the finished tyre or hoop. The bearings of the

“ second-mentioned axis are raised by means of two screws, suitably geared to move the bearings simultaneously. The axes of the three or more rolls which are external of the ring are arranged to turn in bearings which slide between guides, and such bearings are moved by screws, suitably geared to cause them to move to or from the ring of metal simultaneously, and in such manner that the distance between the centre of the ring of metal and the centre of one of such three or more rolls will at all times correspond with the distance between the centre of such ring and the centre of each of the other rolls, by which arrangement or combination of machinery as the massive ring of metal is gradually reduced in thickness and the ring is increased in diameter by the pair of finishing rolls, the three or more other rollers will, by the gearing, move away and increase their distance from the centre of the ring of metal which is being rolled,” while “ by reversing the action of the gearing of the three rollers they will, when desired, be caused to approach the centre of the ring and cause the diameter thereof to be reduced, and thus may tyres and hoops of wheels which have been expanded by use be reduced in diameter,” the machinery by the adaptation thereto of proper rollers, being also capable of rolling iron and steel into rings or cylinders for a variety of purposes.

The details of the invention may be varied ; for example, instead of screws for regulating the distances of the external rollers from the centre of the ring, “ the principle of the hydraulic ram and other known means ” may be used ; and instead of having one machine with rollers for roughing and others for finishing, such roughing and finishing may be performed in separate machines.

[*Printed, 9d. Drawing.*]

A.D. 1857, May 15.—No. 1383.

PARKER, FRANCIS.—Passenger indicator. “ This invention consists in constructing an apparatus for checking the number of passengers travelling by a vehicle, such apparatus consisting of a tube or pipe descending to a bell, gong, or other sounding instrument contained in a box or case which can be securely locked or fastened. A globular or other missile is to be put in at the upper part of the tube

“ or pipe, when it will descend and strike the gong or sounding instrument, either by contact with the surface, or with the end of a clapper or trigger. Thus, should any attendant charged with that duty not put in a missile each time a passenger gets into the vehicle, it would be at once apparent to the passengers and all persons close to the vehicle, and hence he could be checked as to the number of passengers going by such vehicle, the number of missiles found in the box below the gong or bell showing the number of passengers. The tube might be of strong clear glass, and the missiles of some strongly contrasting colour, so that by exhibiting the descent of the missile to the bell or gong attention would be further attracted to the use of this tell-tale, and it might be desirable to have an indicator board or dial in connexion with this apparatus.”

[*Printed, 7d. Drawing.*]

A.D. 1857, May 21.—No. 1430.

HOPKINS, JAMES, and PEARCE, GEORGE. — (*Provisional protection only.*)—Trucks. The invention consists “in the peculiar mechanical arrangement of trucks, which run on rollers instead of wheels. Two or more rollers are combined in a suitable framework with their axles placed in or about the centre of the side framing, so as to allow a portion of the surface of each roller to be exposed above and below the truck bottom. The rollers may be worked simply as rollers in common, either with the goods laid on or raised above them on blocks resting on the truck.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, May 25.—No. 1467.

FORD, HENRY WILLIAM.—(*Provisional protection only.*)—Facilitating locomotion. “This invention consists in the use or employment of rings or hoop railways, within and upon the lower part of which the carriage wheels run or roll. These rings or hoop railways are of greater diameter than the wheels, so as to encircle them without contact, excepting at the lower part of the circumference, where they constantly present a bearing surface between the wheels and the road or ground.

“As the carriage wheels turn round their weight causes the rings or hoop railways to turn or roll upon the ground, and suitable guide grooves or bars fixed on them enable the wheels to keep them in their course or direction of running. Check guides fixed on the carriage also assist in keeping them in their course.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, May 27.—No. 1500.

CRESSWELL, RANDAL.—(*Provisional protection only.*)—Lubricating axles. “The axle or part to be lubricated is enclosed within a box, having an intervening flange or washer, with a reservoir sunk in its upper part for the reception of the lubricating fluid, and a suitable groove communicating above with the reservoir and below with the axle or part to be lubricated for the passage of the unctuous material. Around these is placed a hollow revolving cylinder, which receives the lubricating material after it has done its work, and by its motion conveys it to the upper part, where meeting with a conductor it is directed into the reservoir from whence it started to be re-employed as before. By this arrangement the flow of the lubricating fluid is constant and the supply is regulated as required.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 1.—No. 1539.

FELLOWS, FRANK PERKS.—Casting axle boxes, &c. Part of this invention relates to a method of casting axle boxes on their axles in such a manner that the box is permanently secured upon the axle by the process of casting. The axle is made with collars upon it. It is laid in a mould and the axle box cast round it. The latter may be separate from the wheel or in one piece with it. A cavity for oil may be made by placing on the axle two washers of paper or other suitable material, surrounded by a band of the same, fitting a screwed tube through a hole in the band, and then forming metal into the mould. The air escapes through the tube and the tube being subsequently withdrawn leaves a passage for the introduction of the oil. The ashes of the paper may be removed through this passage. Brass or other tubes, bushes, or washers may be placed in position in the mould and included

in the casting. “If desired, a screw may be cast in the end  
 “of the axle box, and occasionally tightened a little, so as to  
 “press against the end of the axle, and prevent the box from  
 “shaking or rattling after the parts have become worn by  
 “use. The axle may be conical to facilitate tightening.

[*Printed, 2s. 8d. Drawings.*]

A.D. 1857, June 3.—No. 1564.

REMINGTON, GEORGE, and BALCOMBE, JOHN BARION.—(*Provisional protection only.*)—Locomotive engine for common roads. The invention consists in the application to locomotive engines of a portable railway consisting of an endless chain of links or sections of wood or metal or both in combination. In some cases wire rope may be used. The chains extend from front to hind wheels and are secured thereon by flanges or otherwise. There is a chain on each side of the engine, and they are sometimes connected by cross bars. If there are central bearing wheels, the chain may pass over them.

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 5.—No. 1582.

WHEELHOUSE, THOMAS, and GREENWOOD, JOHN.—(*Provisional protection only.*)—Ventilating carriages. The following is the provisional specification:—

“We place or fix a fan under or upon the carriage to be  
 “acted upon, or motion given to, by the revolution of the  
 “wheels in motion; to provide for the outlet or inlet of air  
 “from the said fan, we attach a tube or tubes of any suitable  
 “metal or material to surround the vehicle or carriage, either  
 “inside, outside, or both, as may be found desirable; the  
 “terminus of the said tube or tubes to be at any convenient  
 “position of the carriage for the escape of the air. At or  
 “adjacent to each individual seat of the carriage we may  
 “introduce a hole or slot in the tube or tubes, with a cover  
 “or slide to be opened or closed at the will or convenience of  
 “the person occupying each individual seat, so that each  
 “person may be able to ventilate at discretion. It is quite  
 “evident that this invention is applicable to omnibuses,  
 “railway, and other carriages.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 16.—No. 1684.

FOWLER, JOHN, junior, BURTON, ROBERT, and CLARKE, THOMAS.—Facilitating locomotion of engines and vehicles. This invention consists, firstly, in mounting the driving wheels on short, separate tubular axles, mounted in one solid axis or shaft. The short axles have bevelled gearing which gear “on opposite sides with two, four, or other number of bevelled pinions, which are mounted so that they can turn freely on axes, which form the spokes of a large spur wheel mounted on the solid axis before mentioned; this spur wheel being driven communicates motion to the two driving wheels, but does not prevent one of them from turning faster or slower than the other when the carriage is required to turn.”

Secondly, in assisting locomotives to ascend hills, by securing a rope ahead and then winding it in upon a drum on the engine.

Thirdly, in applying sections of portable railway which, when the wheel bears upon them, grip its V shaped periphery and so increase the bite of the wheels on the road.

And lastly, in substituting for the portable road which is carried round by the wheel, two sections which are alternately lifted and drawn forward along the land. “In order to enable the sections to pass each other, they are placed at different distances from the centre line of the machine, and the wheel which runs on this road is also made in two halves or parts placed similarly at different distances from the centre line of the machine, &c., so that one of the parts of the wheel treads on one of the sections of road, and the other on the other section.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1857, June 16.—No. 1685.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication.*)—(*Provisional protection only.*)—Wheels and axle boxes. “This invention has for its object improvements in the construction of wheels and axle boxes, for which purpose each spoke is composed of two parts, one of metal and the other of wood, which are joined into one at their outer ends. The lower or metal end is formed with a screw socket to receive a



“ screw, and the outer head or end of such screw is formed  
 “ to enter a recess on the inside of the felloe or ring of the  
 “ wheel, and where two ends of the felloe come together the  
 “ end of a spoke is formed with a wedge and screw nut, which  
 “ entering between the inclined ends of the felloe presses  
 “ them away from each other and expands the ring or felloe.  
 “ The inner end of each spoke is fixed to central plates by  
 “ flanges or projecting rings, formed on the two central  
 “ plates, which enter grooves formed in the inner ends of the  
 “ spokes. The central plates have raised edges, or are  
 “ dished, so as to form short cylinders on either side of the  
 “ centre of the wheel. Each of these central plates receives  
 “ into it an inverted hollow cap, the hollow parts of such  
 “ two caps being, when combined in the wheel, placed face  
 “ to face, and each hollow cap has within it several anti-  
 “ friction rollers of a length equal to the depth of the hollow  
 “ of each of the inverted caps. The two central plates which  
 “ receive the hollow caps into them, go together, and  
 “ are fixed by being made with or by having fixed to them  
 “ short tubes, the inner ends of which screw together. There  
 “ is also a tube through the centre of the short tubes, which  
 “ by means of screw nuts fixed at its ends, hold all the central  
 “ parts of the wheel together. The axle passes through the  
 “ inner tube, and has a screw nut on a screw formed at its  
 “ outer end.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 22.—No. 1743.

MURDOCH, RICHARD.—(*Provisional protection only.*)—“Im-  
 “ proved running gear for vehicles.”

The inventor says, “my invention consists in an improve-  
 “ ment in the running gear of vehicles, in which the fore  
 “ wheels are attached to short or half axles. I project forward  
 “ and outward from the front side of each of the said  
 “ short axles a lever or bar, which is firmly attached to the  
 “ axles. The forward ends of these two levers are united by  
 “ a cross bar, which is pivoted to them, and at the middle  
 “ of its length is also pivoted to the pole or tongue of the  
 “ vehicle. The effect of this arrangement is that when the  
 “ vehicle is turned the axles all converge to the common  
 “ centre of the circles described by the paths of the wheels.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 24.—No. 1758.

FULTON, HAMILTON HENRY, and ETTY, THOMAS BODLEY.—(*Provisional protection only.*)—"Increasing the traction and bearing surface of carriage wheels."

"This invention relates to improvements in applying to the wheels of carriages an endless chain or band of any flexible material, or metal, or wood, jointed together in lengths and of a suitable width, which is passed partly round the peripheries of two or more wheels, which endless chain or band would be kept in its place by flanges on the wheels, and would form a way for the wheels to roll upon, and would consist in coupling two or more carriage wheels by a connecting rod, cog, chain, band, or friction wheels, but this coupling does not apply to railway locomotives."

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 27.—No. 1813.

BIGGS, JAMES.—(*Provisional protection only.*)—Folding perambulator. "The back falls down upon the seat, the sides fall conjointly with the back, working on a pivot, thereby economizing space. The handles drop into a tube and are removeable, being secured by thumbscrews. The two hind wheels can be taken off without removing the caps or linch pins, and are fixed to the axle with a cylinder or screw and secured by a thumbscrew. The front wheel and irons are secured with a spring, having a handle to remove it pleasure. The wheels and front irons pack in the body of the carriage, the whole forming a packing case of 10 inches high 15 inches wide and 20 inches long."

[*Printed, 3d. No Drawings.*]

A.D. 1857, June 29.—No. 1819.

MEAKIN, JOHN FORSTER.—Perambulators. For the purpose of stopping the perambulator in case the person propelling it should release it, and thereby avoiding accidents which occasionally occur, the patentee fits a brake block to the front wheel. A spring constantly bears upon the block and tends to force it against the wheel. The block is, however, connected by a cord with the handle of the perambulator, and in such a

way that so long as a person has hold of the handle for the purpose of propelling the vehicle, the brake is kept out of action.

The patentee also fits a hood to the perambulator, which “hood, when not in use, shuts into a space contrived between the inner and outer back of the perambulator body.

There are also hinged arms or rests for the support of sleeping children.

[*Printed, 7d. Drawing.*]

A.D. 1857, July 9.—No. 1908.

DE CLERVILLE, JOHN JULIUS CLÉRO.—(*A communication from Felix Abate.*)—Waterproof material. The material made according to this invention is intended among other applications for awnings and carriage tops. For such purposes the cloth should be treated with a tannin solution prior to coating it in the way described by the patentee as follows:—I apply “a transparent coating upon a fabric of any description “previously dyed or printed of any colour or design according to the system used by calico printers. I prefer to “make the said transparent coating with purified linseed oil, “made drying and thick like a paste by boiling it with some “oxide or salt of lead or of manganese. This coating is perfectly transparent, as no colour whatever is mixed with the “oil, it therefore shows the colour or the design on the stuff, “and lastly I varnish the article with oil, copal varnish or “any other hard oily varnish. I also apply the above process “to make an imitation of varnished leather upon any thick “fabric, such as moleskin.

“I also make an imitation of the grain of leather on fabrics “coated in this way by pressing the coated stuff between hot “engraved rollers or plates, and then I varnish as before. I “proceed in this last manner also to produce embossed or “figured stuffs to imitate embossed and figured leather.”

[*Printed, 4d. No Drawings.*]

A.D. 1857, July 13.—No. 1948.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Portable railway. “This invention of an improved construction of “portable railway for steam traction engines on common “roads or land, consists in constructing the railway of two

“ endless chains of short rails jointed together vertically and  
 “ laterally or horizontally, and working over quadrilateral  
 “ pulleys mounted in adjustable frames, and so arranged that  
 “ as the engine is propelled along, the rails are laid down in  
 “ front, and form in effect a continuous line of railway for  
 “ the wheels to travel over.”

[*Printed, 6d. Drawing.*]

A.D. 1857, July 27.—No. 2048.

DANVERS, PATRICK, and BILLINGS, GEORGE WHITFIELD.—  
 (*Provisional protection only.*)—Rolling tyres. The following is  
 the provisional specification:—“ The iron to form the hoop or  
 “ tyre is bent up in any usual manner, and welded together  
 “ at the ends. The hoop or tyre is then placed, while in a  
 “ heated state, between a pair of rollers with grooved sur-  
 “ faces, adapted to the sectional shape of the hoop or tyre  
 “ whether the same be flat, or formed with a flange, as for  
 “ locomotives, &c. The said rollers are opened to receive the  
 “ hoop or tyre, or forced together to roll the same by means  
 “ of suitable screws and gearing, and the said rollers are con-  
 “ nected to each other, and driven by suitable gearing.

“ We provide above said rollers a horizontal slide, fitted so  
 “ as to be adjusted vertically until it stands at the time of  
 “ the diameter of the hoop or tyre to be rolled. On this slide  
 “ two rollers are applied on sliding blocks, in such a manner  
 “ that a screw fitted in aforesaid slide, with right and left  
 “ handed threads upon it, shall project or retract the said  
 “ rollers to the diameter of the hoop or tyre and these rollers  
 “ which gauge the diameter, in connection with the before-  
 “ mentioned compressing rollers, form the tyre or hoop per-  
 “ fectly round, and of the correct size and shape.

“ A roller or rollers applied on the aforesaid slide, taking  
 “ the edges of the hoop or tyre, keep the same correctly in  
 “ position.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, August 4.—No. 2109.

MACPHERSON, PETER.—(*Provisional protection only.*)—“ Im-  
 “ provements in wheeled carriages or vehicles.”

“ This invention relates to the arrangement and construc-  
 “ tion of wheeled carriages of various kinds with low hung

“ bodies. As applied in carts or waggons to be employed in  
 “ the transmission of cattle or live stock, the body or box of  
 “ the cart or waggon is framed up rectangularly to a sufficient  
 “ height, and the wheels are so attached that the bottom of  
 “ the body but little more than clears the ground. This is  
 “ effected by attaching short carrying spindles one on each  
 “ side of the body sufficiently high up for the purpose. These  
 “ spindles are each held in their proper horizontal and lateral  
 “ positions by suitable brackets or fixture pieces, one upon  
 “ the actual side of the cart body, and the other upon a longitudinal bar or bearer attached at each end to the body, but  
 “ sufficiently far off to admit of the wheel working between  
 “ the two. The wheels may either run loose upon their  
 “ spindles or be fast thereon. The top and back end of the  
 “ body are hinged like doors for the convenience of taking in  
 “ and discharging the stock.

“ For vehicles where springs are necessary, a modified  
 “ arrangement is adopted. In such cases a separate longitudinal spring is fitted up on each side of the wheel, the  
 “ external spring taking the place of the supporting bar previously described. These springs are retained at the ends  
 “ by suitable straps or connecting pieces, each being attached  
 “ at its centre to the spindle of the running wheels. The  
 “ spindles are each forged with or attached to a long vertical  
 “ guide spindle which plays through suitable guide eyes on  
 “ the body as the latter rises and falls upon the springs.

“ Such carriages or vehicles are applicable for various purposes, not only for carrying heavy bodies in particular,  
 “ but also for the ordinary uses of road conveyance.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, August 4.—No. 2112.

CAMBRIDGE, WILLIAM COLBORNE. — (*Provisional protection only*).—“ Improvements in the construction and working of  
 “ endless travelling railways.”

According to the inventor “ the object of this invention is  
 “ to improve the construction of endless railways. First by  
 “ preventing the ends of the portions forming the railway  
 “ from digging into the ground and taking up dirt and refuse  
 “ matters at the joints; and secondly, by preventing the

“ wheels from slipping on the rails at the ends of the links or  
“ length of rails, which together form the endless chain that  
“ surrounds the driving wheel. I suspend shoes or flat  
“ bearings which will drop upon the ground just before the  
“ descent of the links to which they are respectively attached,  
“ and thus receive the end pressure of the joints or links,  
“ instead of allowing the ends to press into the soft ground.  
“ Upon the inner face of the links I form ears or projections,  
“ which act as guides to the wheel (if required) as it passes  
“ over the rail, but they are intended chiefly to form bearings  
“ for a series of pins or lateral projections on the wheel,  
“ which pins, as the wheel revolves, come in front of the  
“ ears, and acting as stops prevent the wheel from slipping  
“ back on the rail. When these ears are not employed as  
“ guides to the wheel, I fit guides to the other side of the  
“ rails and form an annular slot near the wheel’s periphery for  
“ the guides to work in.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, August 8.—No. 2136.

COLLIER, GEORGE, NOBLE, WILLIAM, and WARD, HOLROYD.  
Wood working machinery. The improvements described in  
this specification relate partly “to the production of imita-  
“ tion wicker or basket work, for carriages and other uses, in  
“ wood, by the use of a cutting tool of a peculiar construction,  
“ operated by mechanical means.

“The cutting tool is formed with corrugation or other  
“ irregular surfaces along one side or surface thereof, corre-  
“ sponding with the form of the outline of the intended cut,  
“ by which as the edge of such cutting tool wears away, in  
“ place of having continually to renew the form of the cutting  
“ surface, it will only be necessary to grind or otherwise  
“ sharpen in an inclined direction from the back towards the  
“ front cutting edge.

“This peculiar description of cutting tool is also applicable  
“ when producing other figures than that in imitation of  
“ basket or wicker work. To produce some varieties of imitation  
“ basket or wicker work the cutting tools employed are placed  
“ one in advance of the other, yet so as to cut in parallel  
“ lines, by which in the up and down motion simultaneously

“ given such tools, the cutting produced by one tool will be  
 “ deep, whilst that adjoining in a parallel line will be stand-  
 “ ing up, thereby giving an appearance of crossed work.”

[*Printed, 2s. 8d. Drawings.*]

A.D. 1857, August 12.—No. 2152.

WAGSTAFF, ROBERT. — Traction engines. This invention relates chiefly to a method of propelling traction engines. It  
 “ consists in driving the main wheels by the friction of con-  
 “ tact of other wheels, in order that the wheel at either side of  
 “ the engine may be worked, irrespective of the other when  
 “ required, the engine thereby being under better control. The  
 “ steam for driving is generated in an upright or other form  
 “ of boiler, and exerts its power upon pistons working in  
 “ cylinders as in ordinary engines. Upon the crank shaft  
 “ are secured two wheels, one at each end; these wheels  
 “ impart motion by friction or adhesion of contact to other  
 “ wheels conveniently situated, and each having a pinion  
 “ upon their axis gearing into a larger toothed wheel secured  
 “ upon the main or travelling wheel of the engine, which  
 “ thus becomes driven by means of the friction gearing; it  
 “ will be evident that (such arrangement being applied to  
 “ each side of the engine) one side may be worked entirely  
 “ alone when required, as in turning or running on a curved  
 “ track, or both sides at different speeds, according to the size  
 “ of the wheel in contact with the driving friction wheel;  
 “ or the engine may be stopped by disconnecting or sepa-  
 “ rating the friction wheels, which is effected by means  
 “ of a screw worked by bevel gearing by means of a  
 “ handle. Upon the main wheels” are secured “ lags of wood  
 “ or iron across, and somewhat broader than the tire or rim,  
 “ so that in passing over soft ground the interstices between  
 “ the lags will allow the adhering clay &c. to pass through  
 “ and prevent the wheel from being encumbered by the accu-  
 “ mulation thereof; these lags enable the wheel to hold or  
 “ ‘bite’ the surface and prevent slipping, or they may, if  
 “ preferred, on good travelling roads be dispensed with.

“ The guiding or steering of the engine is effected by  
 “ means of the front pair of wheels, which are also in con-  
 “ nection with and governed by friction gearing worked by

“ bevel wheels by the motion of the guiding wheel or handle.”

[*Printed, 10d. Drawing.*]

A.D. 1857, August 14.—No. 2169.

DRAPER, SAMUEL.—Handles and door fastenings. “This invention has for its object improvements in the manufacture of handles and fastenings for doors of railway and other carriages. For these purposes the stem or spindle of a handle is made of cylindrical rod iron, of the same diameter from end to end; the two ends of the spindle or stem are tapped with male screw threads; on this spindle or stem the tongue or fastening button is fixed. The tongue or fastening button is formed in three parts, the main part being in the middle, and has, at the end where it is fixed to the spindle or stem, two plates, one on each side of the middle or main piece. The friction roller is placed between these two outer plates, and one angle of the main piece is removed to admit of the friction roller being so placed; the spindle or stem is partly fixed to the tongue by one part of the screw formed at that end. The handle is formed by having a bar of iron screwed or fixed on to the end of the spindle or stem, and over this is placed a hollow shell of sheet brass or other suitable metal, into which is screwed the end of a tube of brass or other suitable metal, the screw at the end of such tube and that in the shell being cut or formed in the opposite direction to that on the end of the stem or spindle. The parts above mentioned being put and held together are then further secured and held by running fluid metal (by preference inferior brass) through a hole in the tongue by which the case of the cross bar or handle, also the hollow casing of the stem and the hole or holes through the tongue, will be filled with the metal, and at the same time all parts will be thereby held more securely together. When the tongue or fastening button is to work within a lock or case (let into the door) then in place of fixing the tongue or fastening button to the stem or spindle as above explained, there are two side rods or feathers fixed into the handle and the main stem or spindle by means of the running in of the fluid metal; these rods and the spindle



“ pass through the tongue or fastening button, which is  
 “ placed in the case or lock, and to facilitate the use of a  
 “ friction roller to such tongues or fastening buttons part of  
 “ the side of the case or lock is cut away or removed.”

[*Printed, 6d. Drawing.*]

A.D. 1857, August 15.—No. 2172.

CARDIN, JAMES JOSEPH. — (*Provisional protection only.*) —  
 Brakes for omnibuses. “ This invention consists principally  
 “ in the arrangement and combination of certain levers  
 “ whereby a more speedy application and release of the brake  
 “ is obtained. For the ordinary description of omnibus three  
 “ levers are or may be necessary ; the fulcrum of the first one  
 “ is attached to the end of the footboard farthest from the  
 “ driver, while his foot acts upon the other end ; under this  
 “ short lever is affixed a rod which runs down the front of the  
 “ omnibus, and is connected at the bottom to another lever,  
 “ the fulcrum of which is connected to one side of the omnibus  
 “ while the arm is attached to the end of another lever which  
 “ runs along the side of the omnibus and works on a pivot,  
 “ the short arm having a brake block attached hanging down  
 “ in front of the hind wheel ; when the driver’s foot is pressed  
 “ down on the first lever the others acting in concert, force  
 “ the brake block against the wheel. This action is reversed  
 “ by a spring or springs, whereby the levers regain their  
 “ position on being released from the driver’s foot. By a  
 “ slight modification and addition, the brake can be applied  
 “ to both hind wheels simultaneously. An addition can be  
 “ made by the use of a spring rack, whereby the lever  
 “ worked by the driver’s foot is held down in a fixed position,  
 “ and released again as required.

“ For the ‘ double-headed,’ ‘ saloon,’ or other description of  
 “ omnibus only two levers may be necessary, the shape of the  
 “ head allowing the brake lever to have a direct action with  
 “ the rod worked by the driver’s foot.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, August 20.—No. 2210.

GOUGH, THEOPHILUS, and MARGERISON, JOSHUA.—(*Provi-  
 sional protection only.*)—“ Braking apparatus for vehicles used  
 “ on railways or on other roads or ways.”

“ The brake ” is intended to act on the wheels of any number of carriages simultaneously retarding and stopping their progress by preventing the rotation of the wheels. The power by which the above result is proposed to be obtained may be steam or hand power, aided by the momentum of the train itself. Each carriage is to be fitted with a longitudinal sliding bar with buffer ends; these bars, when the carriages are coupled, form one continuous means of communication between the different carriages throughout the train, and rest on framework attached to the axle bars of each carriage. Working in connection with these sliding bars are transverse levers with elliptical heads, which turn on a pivot or axle maintaining expansive action. These transverse levers operate by an eccentric action on the ends of the rods connected with the break blocks, which by the expansive action of the transverse levers when operated upon by the longitudinal sliding bars, press with immense power on the wheels of the carriages, and thus prevent their rotation. This result is produced equally by a backward or forward motion of the longitudinal sliding bars; and the breaks may be applied either by the guards or engine drivers. If by the guards, the motion is communicated by, and the power derived from, a rackwork and pinion moved by a wheel or lever, or is obtained by the use of an excentric. If the breaking apparatus be applied by the engine drivers, the power may be obtained from the engine, or hand power may be used, as in the case of the guards. The longitudinal sliding bars also form a means of communication between the drivers of the engine and the guards of the train.”

[Printed, 3d. No Drawings.]

A.D. 1857, August 31.—No. 2284.

CLARK, WILLIAM.—(*A communication from Adolphe Joseph Florin.*)—Portable railway. This invention relates to a jointed railway “ which can be adapted to the wheels of all kinds of vehicles. For this purpose ” says the patentee “ I surround the wheels with a system of rails or plates connected end to end. These rails are developed one after another under the wheel, which travels on them. Motion is imparted to the system of ‘endless rails,’ either by the wheel itself or by any other mechanical means; for example, by means of a

“ pressing cylinder or roller fitted behind the carriage, which  
 “ presses on the upper part of the rails, and thereby causes  
 “ them to move as rapidly as the wheels. In order to prevent  
 “ the rails dragging behind by reason of the shocks received,  
 “ I so arrange the jointed system of rails that the upper  
 “ part which is in contact with the wheel is smaller than the  
 “ lower part on which the wheel rolls. The wheel is thus  
 “ furnished with more rolls than are required. In order to  
 “ make up for the inequality in the thickness of the rails I  
 “ use a spring, which gives the pressure to the regulating  
 “ roller. Lastly, each rail as it is unrolled passes a scraper,  
 “ which removes the mud or soil from its surface.

“ Instead of the rails being jointed, they may be continuous,  
 “ and by means of a mechanical contrivance form a second or  
 “ moveable fellow round the fellow of the wheel, on which  
 “ second and moveable fellow the first fellow will roll. The  
 “ economy of tractive force is great; with this system a man  
 “ can draw two thousand pounds weight in a carriage.”

[*Printed, 6d. Drawing.*]

A.D. 1857, September 1.—No. 2288.

TAYLOR, JOHN GEORGE.—(*Provisional protection only.*)—Name boards for omnibuses. This invention relates to a number of improvements among which is included a method of fitting omnibuses with illuminated name boards or indicators. The top rims or sides are pierced with openings showing names of places or otherwise, or moveable slips similarly pierced are fitted to the vehicle, and these openings, which are protected from wind by glass or other transparent substance, are illuminated.

[*Printed, 3d. No Drawings.*]

A.D. 1857, September 7.—No. 2328.

BUTLER, SPILSBURY.—Hearse. This hearse is intended to supersede the ordinary method of transport by bearers and to enable manual power to be used for propulsion. It is supported on one, three, or more wheels. If not less than three are used the front or guide wheel is mounted like a castor. Springs may or may not be added. Hand rails or handles, or cord loops are fitted to the sides for propulsion. The body of

the vehicle partly conceals the wheels. The coffin may be placed either within the hearse or on its top, or two coffins may be carried at one time. The sides may be closed with glass, panels, or curtains, or be left open. Rollers are fitted for the coffin to move upon.

[*Printed, 5d. Drawing.*]

A.D. 1857, September 18.—No. 2417.

MUNRO, JOHN MAY, junior.—Metal wheel stock. The invention is thus described by the patentee:—"At present some wheel stocks are made with an oil box behind, but fixed with a linch pin and cap; other wheel stocks are made without oil boxes, but have bolts through; patent mail axles and boxes have a metal box in a wooden stock.

"Now this invention consists in combining the two systems of oil boxes and bolts through the stock in" the "improved metal wheel stock, and which may be cast in iron or other suitable metal."

[*Printed, 6d. Drawing.*]

A.D. 1857, September 18.—No. 2418.

SAVAGE, ROBERT WATSON.—(*Provisional protection only.*)—Suspending carriages. The following is the inventor's description:—"Instead of hanging carriages or vehicles on springs of the known kinds, I take suitable rope or cord of wire, or other sufficiently pliable material, and I stretch this to any required tension between standards applied beneath the body of the carriage or vehicle, or in other convenient position; the tension being regulated by stretcher hooks sustained by the standards applied to each end of the rope, which can be lightened or slackened by screw nuts or otherwise; this rope works upon a friction wheel or wheels secured beneath or above the axle of the carriage wheel, the rope being confined to the wheel or wheels, which axle may be allowed a very little play backwards and forwards, as well as the usual up-and-down motion; and two ropes may be used, one passing under and the other over the friction wheel or wheels. Each axle sustaining two wheels will have the above arrangement in duplicate. . . . In order to draw and back from the axle

“ I have an iron or irons secured to the axle, and projecting forwards, with hooks close to the back part of the ordinary shafts, to which hooks the horses are to be attached by the traces or otherwise. In pole carriages there will be a suitable ‘perch’ and appliances and the horses will be connected direct with the axles.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, September 18.—No. 2427.

ANDERSON, Sir JAMES CALEB.—(*Provisional protection only.*)—“Improvements in locomotive and other carriages.”

The first part of this invention consists in placing above a tubular locomotive boiler, a horizontal cylinder or steam chamber. By the use of this steam chamber, the boiler may be kept almost full of water “which will secure the tubes to top of the fire box from being left uncovered with water on ascending and descending hills.”

The invention also relates to the use of large wheels, carried in suitable frames, upon the inside of the peripheries of which run the ordinary wheels of the carriage. The large wheels thus form a continuous railroad. They may have flanges fitted to their edges in order to confine the carriage wheels, and they and the latter may be roughed or cogged, or they may be lined with wood to prevent slipping.

The inventor also arranges his engine so that the engine-man is in front and has a full view of the road; the fireman is in rear.

The provisional specification refers to a drawing but no drawing is on the file.

[*Printed, 3d. No Drawings.*]

A.D. 1857, September 18.—No. 2429.

SNELL, HENRY SAXON.—(*Provisional protection only.*)—Skid. “This invention has for its object improvements in apparatus for retarding omnibuses and other carriages. For these purposes the skid or shoe is formed or fixed on one end of a lever or arm, the upper end of which is capable of rotating around the axle on which one of the wheels turns. This lever or arm, with its skid or shoe, is upheld off the road until the horses cease to draw and the traces become slack,

“ when the lever or arm revolves about the axle and the skid  
“ or shoe descends and passes under the wheel, when the  
“ wheel would pass over it but for a stop which is moved into  
“ position, against which the lever or arm comes ; and as the  
“ stop is connected with an ordinary drag chain, the arm or  
“ lever, the skid or shoe, together with the stop and drag  
“ chain, act for the time as an ordinary skidding apparatus  
“ to skid the wheel.

“ When the horses again draw by the traces, the stop  
“ will be withdrawn from behind the arm or lever, and the  
“ wheel runs over the skid or shoe, the arm or lever of which  
“ performs a partial revolution about the axle, and comes  
“ into position to be again called into use when necessary.

“ And apparatus may be further used in combination with  
“ the arrangement described, so as to give control over the  
“ same to the driver or other person.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, September 25.—No. 2480.

JACKSON, JAMES.—Making tires.—“ This invention consists  
“ in manufacturing tires for railway and other wheels, by cast-  
“ ing in a mould a circular mass of steel, which is either  
“ plain on its edge if an ordinary tire is to be made, or  
“ flanged if a railway tire is to be made ; from the centre of  
“ the mass so cast a circular piece is cut or punched by suit-  
“ able tools, and the ring of steel thus obtained is extended  
“ by passing it between rollers, arranged in the same manner  
“ as the rollers which are now used for extending and finishing  
“ ordinary welded up tires.”

[*Printed, 6d. Drawing.*]

A.D. 1857, September 29.—No. 2504.

WELCH, JAMES. — (*Provisional protection only.*) — Portable railway. The inventor says, “ my invention consists of im-  
“ provements on carriages, where what are called portable rail-  
“ ways are used. The portable chains or railways are each com-  
“ posed of an endless chain of rails, each link or rail of which  
“ is formed of two bars of iron, rivetted at one end of them to a  
“ foot or shoe, parallel to each other and with a space between  
“ them, the other ends forming a joint with the foot or shoe

“ of the next succeeding link. The foot projects below the  
“ bars and alone touches the ground. It contains on its  
“ upper side a medial longitudinal groove of sufficient width  
“ to admit the rim of the conducting wheels hereafter men-  
“ tioned. The endless chain is carried round the bearing  
“ wheels of the carriage, is laid down before them, and lifted  
“ again behind by means of two wheels which I call conduct-  
“ ing wheels, one placed before and the other behind the  
“ bearing wheels. As the chain travels over the conducting  
“ wheels, their peripheries pass between the parallel bars of  
“ the links and into the grooves in the shoes, by which means  
“ the chain is secured in its proper position throughout its  
“ revolution. For the purpose of carrying the chain with  
“ smoothness, and preventing the shock of the blow which  
“ would occur at the junction of each link on the passage of  
“ the chain from one conducting wheel to the other, the rims  
“ of the conducting wheels are encircled with india-rubber  
“ or other elastic substance, and a helical or other suitable  
“ spring or elastic substance is set into each shoe to receive  
“ the impact of the conducting wheels.

“ As it is necessary for the well working of the endless  
“ chain that the conducting wheels should run rather near to  
“ the ground, their axles are secured to the carriage by an  
“ open clip long enough to allow the wheel to rise a few  
“ inches independently of the body of the carriage, in case of  
“ meeting with unusually large obstacles lying on the road ;  
“ and a screw or other contrivance is attached to the back  
“ of the carriage, for the purpose of drawing back the axle  
“ of the hinder conducting wheels, and thus tightening the  
“ chain to any required degree. My bearing wheels are each  
“ a double or divided wheel, with a sufficient space left  
“ between its double periphery and double set of spokes for  
“ the revolution of the conducting wheels, by which means the  
“ conducting wheels may be made nearly to approximate  
“ together and the length of the chain is lessened. A flange  
“ is placed both inside and outside of the double bearing  
“ wheel. When the carriage is moved by steam or other  
“ power acting directly upon the wheels to propel the carriage  
“ by their revolution, the endless chain is fitted with a toothed  
“ rack along one side of it, adapted to a toothed wheel run-  
“ ning on the same axle, and revolving with the driving

“ wheel; the toothed wheel is capable of being placed in or  
“ out of gear at pleasure, and is intended to be used only  
“ where the difficulties of the ground might otherwise render  
“ the driving wheels liable to slip round.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, October 2.—No. 2528.

SHAKESPEAR, HENRY JOHN CHILDE.—(*Provisional protection only.*)—One-wheeled carriage. This invention has for its object the construction of a carriage, which the inventor calls “ the unirotal or one-wheeled carriage, and which has a “ single wheel placed behind the body of the carriage; the “ weight of the load to be dragged is placed between the “ wheel and the horse dragging it, and the horse is attached “ to the wheel by shafts and traces. The shafts are furnished “ at the wheel ends with iron loops, through which the axle “ passes; the shafts are prevented from running off by “ screws and pins, and the iron at the ends of the shafts “ is turned up slightly, so that the centre of gravity may “ be below the axle of the wheel. A cross piece of wood “ keeps the shafts apart immediately before the wheel; in “ front of this, the seat of a carriage for travelling or pleasure “ is placed on C springs, or, if for military purposes, a gun “ carriage may be fixed on the shafts, or the gun may have “ a separate carriage to slide off them. The persons carried “ can only sit either knee to knee, or, if double bodied, the “ driver can sit in front nearest the horse, and the sitter “ behind. These kinds of seats can be adopted, but each and “ all on the principle of having but one sitter in a line, that “ is, between the shafts, so that the weight is kept between “ between them. The length of the shafts is regulated by “ the load required to be carried, and the ends of the shafts “ that are attached to the horse are cased in iron. The “ shafts at this place being square,  $2\frac{1}{2}$  inches thick, they are “ looped upon iron square loops 5 inches long, and in which “ the shafts, fitting exactly and being let down, are kept “ from moving by other pieces of iron which turn on hinges “ closing on them, a thumb-screw through, and belly band “ going round the horse, doubly securing them from moving. “ The iron loops are firmly fixed on the tree of a saddle, that



“ goes on the horse, rather larger than the common driving  
“ pad ; this is fixed by web girths, similar to that to a riding  
“ saddle. It is necessary that there should be no motion in  
“ this part of the shafts, they must fit exactly into the iron  
“ loops of the saddle. The breadth of the tyre of the wheel  
“  $3\frac{1}{2}$  inches or more, according to the weight to be borne  
“ by it.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, October 5.—No. 2547.

RICHARDSON, WILLIAM, and RICHARDSON, GEORGE.—  
Brakes. This invention consists in a method of hanging the  
brake blocks so as to be adjustable by a thumb-screw ; also in  
working the brakes by the backward action of the horse or  
horses on the shafts or pole. A bolt or catch is provided  
for the purpose of preventing the action of the brake when  
the carriage is intentionally backed, and springs are also  
applied for the purpose of relieving the wheels of the brakes  
when the latter are not in action.

[*Printed, 7d. Drawing.*]

A.D. 1857, October 6.—No. 2568.

ROMAINE, ROBERT. — “ Improvements in machinery for  
“ digging or cultivating land, part of which improvements is  
“ applicable to agricultural steam engines generally.”

The patentee in describing his invention says:—“ In order  
“ to facilitate the traverse of such engines over the land, I  
“ apply to the running wheels a novel arrangement of portable  
“ way, which forms a kind of endless platform for each of the  
“ wheels to run on. Pendent from the engine boiler, or other  
“ convenient part of the engine or framing, are rods fixed  
“ near the wheels, and connected to the bottom of these rods  
“ by a ball and socket joint, is a rotating skeleton frame. In  
“ this frame radial slots or openings are made to receive  
“ drums, which are free to turn therein, and to move radially  
“ in their slots. The frame is shaped and arranged so that it  
“ shall stand at a slight angle to the ground, and allow only  
“ the drums at the side near the wheel to touch the ground  
“ when the pressure of the wheel is upon them. As the  
“ engine is driven forward the platform will be forced to turn

“ on its centre, and thus bring a drum in position to receive  
“ the rolling wheel as it passes from the drum that it has just  
“ rolled over, and in this way the drums are in succession  
“ brought round from the rear to the front of the advancing  
“ wheel.”

“ To facilitate the turning of the engine at the headland, I  
“ cause the driven running wheels which work loosely on  
“ their axles, to revolve simultaneously in opposite directions.  
“ This I effect by providing two spur pinions for gearing into  
“ the spur teeth of each of the running wheels, and as the  
“ shaft of one pinion acts as an intermediate shaft for driving  
“ the other (when required to be driven), it will be obvious  
“ that a reverse motion may be obtained by throwing one  
“ into and the other out of action by means of a clutch or  
“ other analogous contrivance.”

“ For the purpose of steering the front or leading wheel or  
“ wheels, I employ steam power, which I apply either through  
“ the agency of an hydraulic piston or through bevil gearing;  
“ the leading wheels are mounted in forked bearings, the  
“ vertical stems of which carry a worm wheel, through which  
“ an axial motion is imparted to the forked bearing. A  
“ horizontal rack rod gears into the worm wheels, and carries  
“ at about the middle of its length a piston, which works in a  
“ water-tight cylinder carried by the boiler or framing of the  
“ engine.” “ The piston being propelled will communicate  
“ through its rod the required axial motion to the forked  
“ bearings, and thus turn the wheels into the required direc-  
“ tion; or, the like effect may be produced by causing the  
“ piston or pistons of one or more cylinders to act on ropes  
“ wound round sheaves affixed to the stems of the forked  
“ bearings.”

“ In order to compensate for the irregularities of the  
“ surface over which the engine travels while in action I  
“ connect the leading wheels together by a balance beam,  
“ which has its fulcrum under the boiler; or I connect these  
“ leading wheels together by a rope, the ends of which are  
“ coiled round sheaves mounted on the framing. To enable  
“ the elevation of the engine to be adjusted to facilitate its  
“ travelling up or down inclines, I fit the stem of the forked  
“ bearings which carry these wheels with an hydraulic

“plunger, and cause these plungers to work in vertical cylinders carried by the engine frame, and connected together by a branch pipe.”

[*Printed, 2s. Drawings.*]

A.D. 1857, October 8.—No. 2577.

CRAIG, WILLIAM GRINDLEY.—“Improvements in the manufacture of railway carriage and other wheels formed of cast metal, or having cast metal naves or bosses.” This “invention refers to the manufacture of that class of wheels which are formed of cast metal, or which have cast metal naves or bosses, principally intended to be secured on axles, such as railway carriage and other wheels. The object of the invention is to cast the hole in the nave or boss in which the axle is fixed, and also the key way or bed for securing the wheel on the axle, so accurate and true as to dispense with the boring and key-bed cutting, which is necessary when the boss or nave of the wheel is formed by the ordinary method of casting. This boring and key-bed cutting is indispensable with the ordinary mode of casting, as the core to form the hole in the boss or nave of the wheel is constructed solely of ‘green sand,’ and is held in its position in the mould boxes merely by the core prints left in the sand of the upper and lower box, these core prints being seldom, if ever, strictly accurate in position, as they are generally disturbed by the withdrawal of the pattern. The invention consists in an improved construction of core, and in arrangements whereby the core is more accurately formed, the special object of these arrangements being to enable the core when formed to be correctly placed and held; and also in arrangements by which the boxes may truly fit each other, and hold the core in its correct position; and also in arrangements in the construction of the pattern, so that it may be accurately placed in and withdrawn from the mould boxes.”

[*Printed, 9d. Drawing.*]

A.D. 1857, October 9.—No. 2592.

BROWN, HENRY, and BROWN, WILLIAM.—(*Provisional protection only.*)—Whip socket. “The object of this invention is

“ to render whip sockets more durable, more cleanly, and  
 “ more ornamental than those hitherto in use, and the im-  
 “ provements consist in making the tube part thereof of  
 “ glass or metal, with shifting top and bottom, and mounted  
 “ in metal or otherwise, in such a manner as to allow of the  
 “ tube being rendered shifting or fixed as may be required.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, October 19.—No. 2664.

DE CRISTOFORIS, LUIGI.—Conical wheels. The spokes of these wheels are arranged so that they form a cone, the apex of which is the nave and the base the wheel periphery. The wheel runs on the base edge and the axle is accordingly inclined to the horizon and is suitably held in bearings attached to the carriage framing.

[*Printed, 6d. Drawing.*]

A.D. 1857, October 21.—No. 2687.

SLAWSON, JOHN B.—(*A communication.*)—Box for receiving fares. “ This box is so constructed, that the money deposited  
 “ by the passenger shall be arrested by a sliding board or  
 “ apron until the person authorised to collect the fare shall  
 “ satisfy himself that the amount deposited is correct,  
 “ which he is enabled to do by means of the glass lights  
 “ inserted in the front of the box, between which the money  
 “ lies for that purpose, after which, if correct, he causes it  
 “ to drop into a box arranged underneath for its reception by  
 “ pulling or jerking back the sliding board or apron to  
 “ permit the money to pass into the box, when a suitable  
 “ mechanical arrangement causes the sliding board or apron  
 “ to return to its original position.”

[*Printed, 7d. Drawing.*]

A.D. 1857, October 28.—No. 2733.

SHILLIBEER, GEORGE, and GILES, GEORGE.—Omnibuses.  
 “ This invention has for its object improvements in the con-  
 “ struction of omnibuses, and consists in so arranging them  
 “ that the outside places or some of them may be accessible  
 “ from the interior of the vehicle. For this purpose the body

“ of the carriage is divided off by partitions into three  
 “ separate compartments, of which the two end ones are  
 “ arranged with seats for passengers, the front compartment  
 “ having side seats arranged in the usual way, and the  
 “ hinder compartment having four separate seats, one in each  
 “ corner. A longitudinal passage runs through all the com-  
 “ partments, and by it the seats are entered, there being a  
 “ step at the end of the omnibus as usual. The centre  
 “ compartment is not covered by the roof as the other com-  
 “ partments are, and on the top of the vehicle and on each  
 “ side of the opening through which the roof seats are placed,  
 “ having footboards raised up within the centre compartment  
 “ on the two sides of the longitudinal passage, and the seats  
 “ are reached from this compartment by steps on the two  
 “ sides, which are arranged under the footboards so as not to  
 “ project into the compartment. These outside seats are  
 “ capable of being covered over by a head in wet weather,  
 “ and the middle of the centre compartment between the  
 “ outside seats has a cover capable of being drawn over by  
 “ the conductor, and which is also intended to exclude the  
 “ wet.”

[*Printed, 6d. Drawing.*]

A.D. 1857, October 29.—No. 2746.

GOURLEY, DANIEL DE LA CHEROIS.—(*Letters Patent void for want of Final Specification.*)—Ambulance carriage. “ This  
 “ invention has for its object improvements in ambulance  
 “ carriages, for which purposes the body of each carriage is  
 “ made of such length as to contain on its bottom two  
 “ stretchers, side by side, and longitudinally of the body of  
 “ the carriage. The sides and ends of the body of the  
 “ carriage are preferred to be upright, allowing ample space  
 “ above the wounded men on the stretchers. The stretchers  
 “ have each on their under sides four rollers, to facilitate  
 “ their being moved on the bottom of the carriage; or such  
 “ rollers may be applied to the bottom of the carriage.  
 “ Each stretcher is made with two sliding handles at each  
 “ of its ends, and it is desirable that they should have folding  
 “ legs. The surface of each stretcher is covered with water-  
 “ proof fabric, so as to admit of being washed; and elasticity

“ may be obtained to the stretchers by springs of vulcanized  
“ india-rubber. The body of the carriage is on springs, and  
“ on a single axle with two wheels; and the carriage is  
“ provided with shafts suitable for a pair of horses. Each  
“ carriage, in addition to carrying two persons on stretchers  
“ on the interior, is also made suitable for carrying ten  
“ persons on the outside, for which purpose there is constructed a folding seat at the top on each side, and a foot  
“ board or rest to each seat; and in order to produce a back  
“ to each side seat the roof of the body of the carriage is  
“ raised, and such raised part is covered in at top, around  
“ which a rail is formed, by which a convenient place is  
“ obtained for knapsacks and other articles. Each side seat  
“ is made suitable for four persons in a sitting position, and  
“ the front of the roof is made with two seats having a box  
“ or space between. The sides of the body of the carriage  
“ are made with openings, closed by sliding panels of perforated metal; and the front is closed, and formed with or  
“ without openings for ventilation. The back end is partially  
“ closed by a board hinged to the back end of the body of  
“ the carriage; and it is preferred that this board should  
“ be made in two parts, capable of folding and of being supported in a horizontal position by sliding supports, by  
“ which means a suitable table is obtained for surgical  
“ purposes.”

*[Printed, 3d. No Drawings.]*

A.D. 1857, November 6.—No. 2816.

AITCHISON, ROBERT KER. — Brake. “ In applying this  
“ invention to an ordinary two-horse vehicle the hinder part  
“ of the pole is made parallel and passes through a socket  
“ or between two rollers attached to the splinter bar. The  
“ end of the pole acts against a forked rod, which passes  
“ round the pin upon which the fore carriage turns, and is  
“ connected by a pin to two break levers. These break  
“ levers vibrate upon centres attached to the springs or other  
“ convenient part of the carriage, and their outer ends carry  
“ breaks of wood or other suitable material which act against  
“ the peripheries of the fore wheels. Thus it will be evident  
“ that (the fore ends of the pole being connected to the

“ collars by chains or straps as usual) as soon as the horses  
 “ or other animals are checked the pole will be thrust back,  
 “ and will apply the breaks to the wheels with a corresponding  
 “ force. It will also be evident that in the same manner the  
 “ break will be spontaneously applied whenever the vehicle  
 “ has a tendency to overrun the horses in descending a hill.  
 “ A spiral or other spring is to be applied to the break levers  
 “ or the pole, so as to withdraw the breaks and thrust the  
 “ pole forward as soon as the backward pressure is removed  
 “ and the horses commence to draw, or the splinter bar or  
 “ the traces may be so connected to the pole as to draw it  
 “ forward as soon as the traces tighten. The pole must be  
 “ provided with a pin or bolt to lock it and prevent its  
 “ sliding backwards whenever it is desired to “back” the  
 “ carriage without applying the breaks. This bolt may be  
 “ made self-withdrawing by means of a spring, and be  
 “ brought into action by a lever or other contrivance under  
 “ control of the driver.”

[*Printed, 9d. Drawing.*]

A.D. 1857, November 17.—No. 2879.

GEDGE, JOHN.—(*A communication from William Adolphus Zempliner.*)—Brake. This brake is put on by the backward action of the horse or horses in pulling up. Either the pole or the splinter bar moves backwards and presses the brake blocks against the wheels. The forward movement of the horses takes off the brakes. If the pole or splinter bar be not moveable, a rod may run under or through the pole and so actuate the brakes.

[*Printed, 6d. Drawing.*]

A.D. 1857, November 19.—No. 2904.

CLAY, WILLIAM.—Metal knees for ships, waggons, carriages, &c. The patentee says “in carrying out my invention I take  
 “ a bloom ingot or bar of steel and roll it down into a taper  
 “ or other suitable form, such as is required for metal knees  
 “ for ships, buildings, railway or other waggons or carriages,  
 “ by means of a rolling mill and apparatus, such as is  
 “ described in the specification of a patent granted to me,  
 “ and bearing date December 16, 1848. I would remark,

“ however, that although I prefer to use the mechanical  
“ arrangement shown and described in the specification of  
“ my former patent above referred to, it will be obvious that  
“ the object may be effected by other mechanical con-  
“ trivances ; ” “ and I would further remark that any desired  
“ section may be employed according to the particular pur-  
“ pose for which the knees are to be used.

“ An obvious modification of the above consists in making  
“ the knees (which may be of any desired section) from a  
“ compound bar composed partly of steel and partly of iron.  
“ When the knees are made from a compound bar composed  
“ partly of steel and partly of iron, I prefer that the steel  
“ part of the bar should be at that part of the knee which is  
“ subject to compression when the knee is strained, and the  
“ iron part should be at that part which will be subjected to  
“ a tensile strain. The material known as homogeneous  
“ metal, or a mixture of iron and steel, made into an ingot  
“ and rolled down to the required form, may also be em-  
“ ployed for making knees, and will be found to be superior  
“ to the ordinary iron knees.”

*[Printed, 3d. No Drawings.]*

A.D. 1857, November 19.—No. 2909.

CLARKE, JOHN.—Shafts and poles. The invention consists in making shafts or poles of iron or steel tubing, which may be of different sections or shape. It may be tapered or not.

*[Printed, 3d. No Drawings.]*

A.D. 1857, November 20.—No. 2920.

BRUSSAUT, PIERRE ALPHONSE.—“ Antifriction apparatus for  
“ shafts, axles, and other revolving surfaces.”

The “ apparatus consists of rollers or cylinders arranged  
“ round a shaft or axle or other revolving surface, each roller  
“ or cylinder being in itself free to revolve within a box or  
“ frame, and all the rollers being connected to each other by  
“ endless straps or bands of leather, gutta percha, or other  
“ like suitable material. In order to increase the efficiency  
“ of the apparatus, one set of rollers placed round the shaft  
“ may be contained in a cylinder or ring, which is again



“ surrounded by other friction rollers connected by straps or  
 “ bands, and working within a circular box, cylinder, or  
 “ bearing.”

[*Printed, 6d. Drawing.*]

A.D. 1857, November 24.—No. 2939.

SEARBY, WILLIAM.—(*A communication.*)—Spring for carriage seats, &c. According to the patentee, the spring  
 “ consists of a piece of elastic metal, preferably steel; or  
 “ elastic wood, or bone, preferably cane or whalebone; this  
 “ metal, or wood, or bone is set, bent, or compressed into a  
 “ curved form, so that when pressure is applied it will by  
 “ altering its figure, having the curve either flattened or  
 “ sharpened, or otherwise changed, yield to the pressure, and  
 “ when the pressure is removed resume its original form.  
 “ When applied in practice to any article, I prefer to have the  
 “ extremities of the springs or the parts of them which  
 “ receive the thrust of the pressure applied, so arranged that  
 “ they shall be free to play or move, so as to allow the  
 “ elongation and contraction of the curved form of the  
 “ spring; I effect this by allowing the extremities to slide  
 “ in grooves, or on rollers, or by attaching the ends or  
 “ bearing parts to a hook or eye, which said hook or eye is  
 “ allowed to travel freely in another bent and fixed guide  
 “ hook, or by any other known process for effecting that  
 “ purpose.”

[*Printed, 6d. Drawing.*]

A.D. 1857, November 26.—No. 2952.

SHONER, JOHN FREDERICK.—(*Provisional protection only.*)—  
 Splash boards. The following is the inventor's provisional  
 specification:—“ This invention relates to certain improve-  
 “ ments in vehicles of all kinds for common roads, whereby  
 “ the body of the vehicle is kept free from any dirt that may  
 “ be taken up by the wheels, and consists of an improved  
 “ construction and arrangement of the splash leathers, which  
 “ I propose to attach to the axles or to the springs in place of  
 “ the side of the vehicle, as is at present the case. By this  
 “ means the splash leathers may be made much narrower  
 “ than the ordinary leathers, and the wheels may be brought

“ closer to the sides of the vehicle. These splash leathers  
“ may be made of or covered with any suitable material, and  
“ may be made either flat, convex, or with one or more  
“ angles. In order to protect ladies' dresses from the wheels,  
“ I propose attaching a screen to the front part of the splash  
“ leather of the hind wheels, which screen may be fitted on  
“ or removed at pleasure, and may either go the whole length  
“ or any desired portion of the length of the splash leather.  
“ A brush of short hair or other convenient apparatus move-  
“ able at pleasure may also be used in combination with my  
“ improved splash leather, for the purpose of removing the  
“ dirt from the wheels as they revolve. By this mode of  
“ attaching the splash leathers a uniform distance is main-  
“ tained between the leathers and the wheel tyres, as the  
“ wheels and splash leathers will always work together.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, November 30.—No. 2973.

DE LA FONS, JOHN PALMER.—(*Provisional protection only.*)—  
Skid for wheels. “ This invention has for its object improve-  
“ ments in apparatus for retarding omnibuses and other  
“ carriages. For these purposes the skid or pan is made in  
“ two parts, the upper part is made with a curved upper  
“ surface on to which the wheel runs when the skid is used.  
“ This part of the skid has two lugs or projections one on  
“ either side at the back end thereof, between which the wheel  
“ enters. The skid has also two other lugs or projections with  
“ holes through them, corresponding with holes in like projec-  
“ tions formed on the other part of the skid, which is formed to  
“ fit the part first mentioned. The skid has one end of a lever  
“ fixed to it, and it is attached to a drag chain in like manner  
“ to other skids or pans. The lever at its other end comes  
“ conveniently to the footboard so as to enable the conductor  
“ to depress such part of the lever by his foot or otherwise,  
“ when it is desired to lift the skid off the ground, and the  
“ back or upper end of the lever is continually pressed on by  
“ a suitable rod, so long as the skid is required to be out of  
“ use, the rod being fastened or locked in position, so that  
“ the unlocking of the rod allows the skid to descend to the  
“ ground.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, December 2.—No. 2995.

FRANCIS, JOSEPH, and MANBY, CHARLES.—Wagons for army and store purposes. “ This invention has for its object  
“ improvements in the manufacture of wagons and other  
“ vehicles applicable to the transport of troops and military  
“ and other stores on land and water. For these purposes  
“ the bodies of carriages are made of corrugated sheet metal  
“ or of sheets of metal, which are made with longitudinal or  
“ other depressions or cavities on one side, and consequent  
“ projections or convexities on the other side, such pro-  
“ jections or convexities not proceeding to the edges of  
“ such sheets when using corrugated sheet metal; where the  
“ corrugations proceed to the edges, then in joining the ends  
“ and forming the angles of the body of a wagon or other  
“ carriage corrugated or undulating angle iron is used, by  
“ which better rivetted joints can be produced, and the joints  
“ more readily rendered watertight. In some cases, in place  
“ of allowing the corrugations to proceed to the edges, the  
“ sheets where they come to the angles are rendered flat or  
“ free from corrugations, and in that form they are rivetted  
“ together. The fore part of each body of a carriage is made  
“ of a shape suitable to facilitate its passage through the  
“ water, and this part is enclosed and made air-tight, so as to  
“ be buoyant; hence, when the bodies of two wagons or  
“ carriages are fixed together back to back or end to end  
“ there will be a buoyant chamber at each end, which will be  
“ of importance when the bodies of carriages are being used  
“ as boats or floating vessels; and in addition to the buoyancy  
“ obtained as above, the bottoms of the bodies of wagons or  
“ carriages which are made of corrugated or indented iron  
“ are covered or inclosed watertight, so that the hollow en-  
“ closed spaces will add to the buoyancy of the whole. The  
“ upper edges of the bodies of wagons or other carriages are  
“ made with capping, which fits on to and is rivetted to the  
“ edges, or the same are strengthened by angle iron. At the  
“ upper edges of the bodies of such wagons or carriages row-  
“ locks are applied, and provision is made for carrying oars,  
“ so that they may be in a convenient position for being  
“ brought into use. The framework or bed is constructed of  
“ angle iron, or ribbed iron, with braces and cross pieces to

“ give strength and lightness. The running gear is attached  
“ to the framework by jaws and catches or screws in such  
“ manner as to admit of the same being detached and re-  
“ attached with facility.”

[*Printed, 10d. Drawing.*]

A.D. 1857, December 10.—No. 3051.

THER-KATZ, GUILLAUME.—(*Provisional protection only*).—  
Indicator for carriages. The inventor says, “ my improved  
“ registering and controlling apparatus is fitted in the com-  
“ mon coach side lantern. This side is made of a glass  
“ plate divided somewhat like a compass card into a suitable  
“ number of radii, every other one of which is painted with an  
“ opaque white colour, whilst the intermediate ones are left  
“ unpainted. A moveable glass disc divided in the same  
“ manner as the former, is placed behind this glass plate  
“ inside the lantern on an axis which is under the command  
“ of the coachman ; every other radius of the said disc is  
“ painted red or any other colour, whilst the intermediate  
“ ones have merely a number beginning from one up to the  
“ highest. When there is no passenger in the carriage, the  
“ moveable disc should be turned,” to show “ only red and  
“ white rays, whilst when the carriage is occupied the disc  
“ should be turned,” so that “ the red rays are hidden and  
“ all the figures are visible. When the coachman starts in  
“ the morning, the lantern is set up by a special controller  
“ with the red rays visible ; on the first person stepping in,  
“ the coachman bears on a small handle, causing the disc to  
“ move round only one tooth at a time, showing No. 1 up  
“ under the arrow, at the same time the coachman presents  
“ a card folded in two, having a printed dial similar to that  
“ of a watch with the 12 hours and 60 minutes, and holding  
“ this card doubled up he pricks it through with a pin oppo-  
“ site to the hour and minute at which the passenger steps  
“ into the carriage. The card is then torn in half ; one of  
“ the pieces is given to the passenger, whose interest it is to  
“ ascertain whether the time has been rightly marked. The  
“ second part of the card is slipped by the coachman into a  
“ small narrow glass case under the lid, where it remains  
“ visible as long as the carriage is occupied. When the

“ passenger steps out, the coachman must present him with a  
 “ similar card, but of a different colour, on which he pricks  
 “ the hour and minute at which the passenger leaves the  
 “ coach; the card thus given to the passenger is worth one  
 “ penny, and may be exchanged by him on the same day  
 “ either for a postage stamp or a cigar, thus furnishing a  
 “ means of checking the number of half cards which will be  
 “ found in the evening in the lantern. When the passenger  
 “ has left, the coachman turns the disc to show the next red  
 “ ray, which causes at the same time the first card put in to  
 “ fall down into a locked box, and the second coloured card  
 “ is slipped” in. “This is repeated with each passenger  
 “ stepping in or out of the carriage; the coloured or num-  
 “ bered rays showing at any moment whether the coach is  
 “ occupied or empty, whilst the cards found in the evening  
 “ in the locked box” permit of controlling “the number of  
 “ passengers registered by the arrow on the moveable disc, a  
 “ double control being thus effected by comparison with the  
 “ coloured cards found every day at the cigar merchants.”

[*Printed, 5d. Drawing.*]

A.D. 1857, December 14.—No. 3071.

BRIGNON, JEAN PIERRE.—Forging tires. “This invention  
 “ consists in the construction of an apparatus which combines  
 “ an hydraulic press with the steam cylinder and piston of  
 “ the ordinary pile hammer.

“The steam cylinder is firmly fixed on the top of a strong  
 “ frame supported by suitable pillars, and the piston rod is  
 “ fitted with a hammer or mandril in the ordinary manner.  
 “ To the lower part of the frame and underneath the hammer  
 “ is fitted the hydraulic press. The head of the ram of the  
 “ press forms a table upon which the iron to be forged is  
 “ placed; moulds also may be fitted to the apparatus to form  
 “ the tires of railway and other wheels, or for any other  
 “ purpose to which the ordinary pile hammer is applicable.”

[*Printed, 6d. Drawing.*]

A.D. 1857, December 21.—No. 3132.

BOUSFIELD, GEORGE TOMLINSON. — (*A communication.*) —  
 Springs. The first part of this invention relates to various

methods of coiling volute springs by means of single or double conical rollers and mandrils. When two conical rollers and a double conical mandril are used the former turn in opposite directions and coil a double spring out of one properly shaped blank of sheet metal.

The rest of the specification describes a method of equalising the strains on carriage springs when sudden jerks are experienced. The vehicle is supported at each end of the axletree, upon a volute spring. Each spring has a system of toggle jointed bars, each of which systems is connected with the other so that when one spring is compressed, the bars diffuse or communicate the strain to the spring at the other end of the axletree.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1857, December 22.—No. 3141.

JOHNSON, JOHN HENRY. — (*A communication from Louis François Clément Bréquet.*) — (*Provisional protection only.*) — Indicator for carriages. “The length of time during which  
“any one of the external signals is shown is indicated by  
“means of a pencil or other marker upon a card inside the  
“cab, such indicating apparatus being actuated by clockwork  
“or connecting mechanism, whilst the position of the pencil  
“is adjusted by mechanism in connection with the mechanism  
“employed for adjusting the external signals. These external signals may consist of a number of inverted cups or  
“hollow boxes painted each of a different colour, and sliding  
“one inside the other after the manner of a telescope, the  
“whole being placed in any conspicuous part of the vehicle.  
“These coloured signals are slid up and down to show any  
“combination of colours required, according to the meaning  
“to be conveyed, by means of a horizontal lever working over  
“a notched bar, and actuating, by means of inclined surfaces,  
“other levers in direct communication with the coloured  
“signals.

“The indicating apparatus inside the vehicle is totally out  
“of the control of the driver, and consists of a disc of card-board or other suitable material which is made to revolve  
“once in 24 hours by means of clockwork or other convenient  
“mechanism. This disc has a number of concentric circles  
“drawn upon its face, against which is pressed a pencil

“ point or other line indicator or marker. An arm working  
 “ on a fulcrum at one end and carrying the pencil at the  
 “ other is raised or lowered simultaneously with the external  
 “ signals, and as each circle corresponds to a given signal, it  
 “ follows that as the disc revolves the pencil will trace a  
 “ curved line on that circle which corresponds to the signal  
 “ shewn outside, and as the face of the disc is divided into  
 “ hours and fractions of hours, the length of the marked line  
 “ will indicate the direction of time that any given signal has  
 “ been shewn. The elevation and depression of the arm  
 “ carrying the pencil is effected by an incline attached to and  
 “ moving with the inclines which adjust the external signals.  
 “ If found desirable the lever which changes the position of  
 “ the pencil may be made to start a counter or time keeper of  
 “ any kind when brought into the position for indicating that  
 “ the vehicle is engaged by the hour, so that the fare and  
 “ coachman may see the exact time occupied.”

*[Printed, 3d. No Drawings.]*

A.D. 1857, December 23.—No. 3151.

MOSS, JOSHUA, GAMBLE, THOMAS, and GAMBLE, JOSEPH.—  
 Cast steel hoops, &c. The patentees say:—“ The object of  
 “ our invention is to produce a hoop or cylinder of steel solid  
 “ throughout, and without joint or weld, to be afterwards  
 “ rolled into tyres for railway and other wheels; but we do  
 “ not limit ourselves to the making of hoops for tyres, as after  
 “ the hoop is made in the manner hereafter described it may  
 “ be used for many other purposes. We are aware that  
 “ various attempts have been heretofore made to cast solid  
 “ steel hoops, but not with success, on account of a portion  
 “ having been formed with a honeycombed surface.

“ Now, our invention consists in pouring the metal into a  
 “ suitable mould placed vertically through two mouths or  
 “ conduits at the upper part, and near the two top sides of the  
 “ mould or mould casing. These conduits or mouths rise  
 “ sufficiently high from the periphery or outer edge of the  
 “ annular space into which the metal is to be run to receive  
 “ the whole of the honeycomb or top surface of the metal,  
 “ consequently the annular space in the mould is entirely  
 “ filled with solid metal without any hollow or honeycombed

“ surface. The whole of this surface is received in the two  
“ mouths or conduits, and being cut off from the hoop or  
“ cylinder after being removed from the mould, there remains  
“ a solid cast-steel ingot in the form of a hoop or cylinder.”

[*Printed, 3d. No Drawings.*]

A.D. 1857, December 23.—No. 3153.

NORTON, CHARLES.—(*Provisional protection only.*)—Carriage door shield. To the door is attached a curved piece of metal. This piece extends from the top to the bottom of the door, and slides into a curved recess in the post of the door frame. Another curved piece is attached to the post and overlaps the piece attached to the door. By this shield or guard the hinge spring is protected from the inside of the vehicle, and accident prevented.

[*Printed, 5d. Drawing.*]

A.D. 1857, December 24.—No. 3158.

PLAYLE, THOMAS.—(*Provisional protection only.*)—Two-wheeled carriages. “ This invention applies chiefly to spring carts in  
“ which the centre of gravity or the draught is changed or  
“ adjusted either by moving the body of the vehicle or by  
“ raising or lowering the shafts. The usual method now employed to move the body of the vehicle is a screw fixed  
“ behind, the body being mounted so as to slide horizontally  
“ in accordance with the action of the screw.” This “ improvement consists in dispensing with such horizontal movement of the body of the vehicle, and in adjusting the  
“ draught by means of vertical screws fixed at the hinder part of the vehicle. The shafts are not rigidly attached to  
“ the body of the vehicle, but are allowed sufficient play to  
“ admit a kind of beam action; they pass underneath the  
“ body, and are connected with the vertical screws behind in  
“ such manner that they may be raised or depressed thereby.  
“ The portions of the shafts underneath the body are composed of steel spring and wood, and act as extra springs in  
“ addition to the springs now used. Each adjusting screw  
“ has a register by which its action is regulated.”

[*Printed, 3d. No Drawings.*]



A.D. 1857, December 26.—No. 3165.

CHAPLIN, ALEXANDER.—Traction engines, &c. Part of these improvements relates to a previous patent granted to the present patentee for improvements in steam boilers, and dated 10th April 1855. The invention also relates to the construction of vehicles propelled entirely or partly by steam power. In some cases the engine or carriage is propelled by steam, but is steered by a horse in shafts attached to a swivelling fore carriage. After some description of the boiler and engines of a “self-propelling” engine, the patentee states that “the power of the engine is transmitted to the propelling wheels by the following means:—The crank shaft, which is placed at the lower part of the boiler, and parallel to the axle of the propelling wheels, has fast to it one or two driving pinions. These pinions are furnished with clutches or couplings and hand levers, so that one or both of the propelling wheels may be thrown into or out of gear as desired, —by means of a spur wheel or wheels keyed upon the driving or road wheels. In this manner the motion of the engine propels the carriage over the ground according to the ratio of the gearing employed by the traction of the propelling or road wheels. In arranging and constructing the road wheels, it is preferred to have a portion of the periphery of the wheels serrated, so that when travelling over soft ground the serrated portion sinks into and takes hold of the soil, thereby assisting the locomotion of the engine over the ground. The serrated portion of the periphery does not project beyond the plain part of the circumference, in order that when the engine is progressing over firm ground the superincumbent weight is borne upon the plain surface of the wheels, and the machine moves smoothly and steadily onwards. The projecting teeth or serrations may be of various dimensions. It is preferred to make them of a simple V shape, and not placed close together, but at regular intervals apart round the periphery of the wheel. When the engine is in motion and travelling over the ground, it is guided in its course by the driver or engineer, who by turning a hand wheel actuates a screw worm wheel and lever, which causes the leading road wheel or wheels to turn in the required direction. One or two leading road wheels

“ may be employed at one end of the carriage, each wheel  
“ being made to swivel upon its own axis, so as to cause the  
“ engine to deviate to the right or left as required. An engine  
“ of this kind may be used upon a road, a railway, or a tram-  
“ way; in the two latter cases the wheels are keyed upon  
“ rotatory axles, and the guiding apparatus is dispensed  
“ with. In all cases, however, the ratio of the gearing to the  
“ driving wheels may be changed from time to time in order  
“ to obtain the proper working velocity of the piston, and  
“ vary the speed of the carriage according to the load im-  
“ posed upon the engine. The coal boxes and tank for hold-  
“ ing the feed water are arranged beneath the main framing  
“ of the carriage in the space usually left for the swivelling  
“ of the front pair of road wheels of an ordinary carriage, or  
“ in a portable engine of the ordinary horizontal construc-  
“ tion. The carriage frame and wheels of this machine being  
“ removed, the boiler and engine may be used for stationary  
“ purposes. The boiler of these improved engines may be  
“ fired either from a platform placed between the sides of the  
“ framing or from the ground.”

[*Printed, 4d. No Drawings.*]

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1858.

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A.D. 1858, January 7.—No. 27.

REILLY, JAMES, the younger.—Seats. “ To the frame or  
“ body of the chair or seat I attach,” says the patentee, “ a  
“ cylinder or guide, the interior of which is fitted with a rod  
“ or piston, having a spring in connection with it so arranged  
“ as to give elasticity to the seat which is connected to the  
“ rod or piston, at the same time affording the means of  
“ giving a swivel or rotatory motion; the elasticity may be  
“ given to any extent, either for care or comfort, or for giving  
“ a vertical up-and-down motion for amusement or exercise.  
“ By placing the cylinder in a ball or universal joint any  
“ description of see-saw or oscillating movement may also be  
“ given; or, instead of placing the cylinder on the body or

“ frame, it may be attached to the seat, the rod or piston being  
 “ connected to the framing. The improved chair or seat may  
 “ either have the ordinary legs, or they may be dispensed  
 “ with as desired, and the lower part of the frame furnished  
 “ with rockers or made partly spherical, so as to afford another  
 “ mode of giving see-saw or other amusing movements. Any  
 “ suitable number of cylinders and pistons may be employed,  
 “ or in their stead guides and rollers may be used. Treddles  
 “ can be attached when desired to the cylinder or piston, in  
 “ order to give the vertical movement, or handles placed in  
 any convenient position will answer the same purpose.

“ My said improved seat is applicable to perambulators, the  
 “ wheels of which I tyre with india-rubber or gutta percha,  
 “ to avoid the disagreeable noise now so generally complained  
 “ of,” and to other things.

“ The advantages of these seats for railway and other car-  
 riages where the space for each person is limited, will be  
 “ very obvious, as each person will be able to arrange or  
 “ adjust himself to any position to avoid annoying his neigh-  
 bour, and still keep perfectly square in his seat; and for  
 “ children and invalids the advantages will be incalcu-  
 lable.”

[*Printed, 6d. Drawing.*]

A.D. 1858, January 9.—No. 42.

CHAUFOUR, JULES ALPHONSE MATHIEU.—Axle boxes. “ This  
 “ invention relates to improvements in axle boxes and bear-  
 “ ings for axles of railway and other carriages, shafts of  
 “ screws and other machinery. The improvements are as  
 “ follows:—

“ First, the application of friction collars to the journals of  
 “ the axles of railway and other carriages to prevent concus-  
 “ sion or shaking.

“ Secondly, the application of rings to tighten and support  
 “ a number of packing cylinders or antifriction rollers.

“ Thirdly, the construction and application of adjustable  
 “ shells or friction bearings for containing the packing cylin-  
 “ ders or rollers.

“ Fourthly, the application of a wedge to permit the intro-  
 “ duction of the packing cylinders.

“ Fifthly, in a peculiar arrangement of the grease boxes or reservoirs.

“ Sixthly, the application of a screw for tightening the bearings.

“ The axle box is provided with a cap or cover, fitted with a reservoir for the grease. The upper reservoir or grease box contains a pipe to convey the grease to the packing cylinders. The lower reservoir receives the waste grease, which may be removed when necessary.

“ The axle bearing or plumber block also contains reservoirs or grease boxes for supplying the journal and cylinders with grease.”

[*Printed, 10d. Drawing.*]

A.D. 1858, January 19.—No. 86.

DE TIVOLI, VITAL.—Omnibus. The object of this invention is to afford to omnibus passengers comfort, security, and independence from one another, each having easy access to a separate seat in a separate compartment. It consists in constructing the body of the omnibus so as to divide it into as many compartments as there are seats. The seats and compartments are disposed on two rows with backs to the central line and fronts facing both the sides of the street; access to the seats can be obtained by the means of two (or more) steps from the ground, either divided by a railing for each seat, or surrounded by a rail in the shape of a general external gallery for all the seats. The seats on the top of the ceiling are also placed back to back from one end to the other of the omnibus, and in front of it in the usual way. These may also be divided by arm supports, and the whole sheltered from the rain by a canvass stretching in the form of a blind.”

[*Printed, 6d. Drawing.*]

A.D. 1858, January 19.—No. 90.

JOHNSON, JOHN HENRY.—(*A communication from Isaac P. Wendell and Jacob L. Wendell.*)—(*Provisional protection only.*)—Axle boxes and axles. “ With regard to the boxes and axle journals of ordinary common road and other vehicles where the wheels run loosely upon their axles, it is proposed to

“ construct the box which is driven into the hub of the wheel  
 “ in the usual manner in two parts, namely, an outer and an  
 “ inner portion, which are so arranged that a collar formed  
 “ on or about the middle of the axle journal shall be retained  
 “ between these parts and in the interior of the box, and kept  
 “ in constant contact with the lubricating material which is  
 “ contained in suitable chambers in the two portions of the box.  
 “ The ordinary external front nut and washer for keeping the  
 “ wheel in its place are dispensed with, and the usual collar  
 “ at the back of the journal may be used in connection with  
 “ an elastic or other suitable washer for the purpose of retain-  
 “ ing the lubricating material within the box, and of prevent-  
 “ ing the entrance of dust and grits therein. The inner por-  
 “ tion of the box is screwed into the outer portion, and is  
 “ made in two halves to allow of its being placed on the  
 “ journal, the entire end strain of which is received by the  
 “ intermediate or central collar formed thereon, and situated  
 “ between a shoulder formed inside the outer portion of the  
 “ box and the abutting rod of the inner portion of the  
 “ same.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, January 20.—No. 100.

RISHWORTH, CHARLES.—Springs. This invention consists in an arrangement of apparatus by means of which “the pressure or force of concussion” is prevented “from acting directly upon the elastic media or springs.” The spring, which is “spiral or segmental,” is placed within a frame of jointed bars, which frame when the spring has to be brought “into action, either compresses or stretches the spring within it according as it may be preferred that the apparatus should be constructed.”

[*Printed, 6d. Drawing.*]

A.D. 1858, January 21.—No. 109.

MURDOCH, JAMES.—(*A communication from J. H. Clément.*)—(*Provisional protection only.*)—Brakes. These improvements are based upon those protected by a prior patent granted to J. H. Clément in 1855, No. 2318. A shoe is allowed to drop upon the rim of the wheel at a very acute angle and during

the rotation of the wheel is drawn round so as to grip it.  
 “ While thus being drawn round, it acts upon a strong spring,  
 “ the reaction of which forcibly presses the shoe against the  
 “ rim of the wheel. To limit the distance through which  
 “ the shoe shall be drawn, a stop or support arrests it at a  
 “ short distance above a line passing through the axes of the  
 “ wheels. The object of this short distance is that when the  
 “ sliding of the wheel ceases, the reaction of the spring may  
 “ impart a retrograde movement to the wheel.” Various  
 “ methods of applying this principle are shewn in this specification, single or double shoes being shown applied to  
 “ wheels.

[*Printed, 6d. Drawing.*]

A.D. 1858, January 21.—No. 114.

CLARK, WILLIAM.—(*A communication.*)—Lubricating axles.  
 “ This invention relates to oil boxes for lubricating the axle  
 “ bearings of railway trucks and other carriages, horizontal  
 “ shafts, &c. This oil box contains at its lower part:—1st,  
 “ an oil box, properly so called, lubricating the axle journals  
 “ or bearings by the aid of a capillary pad placed in an upper  
 “ reservoir or chamber; 2ndly, a lower reservoir into which  
 “ the oil enters when it drops off the journal, which oil may  
 “ be used again. It contains at its upper part an ordinary  
 “ grease box, which is intended to serve as a grease box when  
 “ the oil box cannot be used from any cause.”

[*Printed, 10d. Drawings.*]

A.D. 1858, January 26.—No. 140.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Substitute for leather. “ The fabric which constitutes this invention is  
 “ composed of cotton or other fibrous substance, either woven  
 “ into cloth or in an unwoven state, saturated and coated with  
 “ a compound of linseed oil and burnt umber, prepared by  
 “ boiling in every gallon of oil about three pounds of umber  
 “ in a powdered state for such a length of time that the composition when cool will roll in the hands without sticking.  
 “ This fabric may be made in forms suitable for the various  
 “ purposes for which it is intended to be applied, as, for  
 “ instance, as a substitute for carriage and harness leather.

“ The mode of producing the fabric differs to some extent  
“ according to its form or the purpose for which it is intended  
“ to be used, but the elements thereof are in all cases the  
“ same.”

[*Printed, 4d. No Drawings.*]

A.D. 1858, February 5.—No. 216.

WELCH, JAMES. — “Improvements in railway and other  
“ carriage brakes.”

The object of this invention is to construct an apparatus  
“ capable of being brought into action by means of the pres-  
“ sure of the ordinary buffing machinery of railway carriages  
“ or otherwise by the reversed action of the propelling power,  
“ without impediment to the carriage being pushed back-  
“ wards by the buffers immediately after it has stopped in  
“ the usual manner, and without the necessity of awaiting  
“ the recoil of the buffer springs.” Upon the axle of a rail-  
“ way or other carriage, in addition to the ordinary running  
“ wheels, the patentee applies “a drum or wheel running  
“ loose upon the axle, but furnished with a spring catch  
“ acting against a stop on the running wheels, or other  
“ suitable contrivance for engaging the drum with the  
“ running wheels, and so compelling the drum and wheels to  
“ revolve together when moving in a forward direction, and  
“ for disengaging itself from them when moving in a back-  
“ ward direction. To this drum is applied a brake in the  
“ ordinary shape of a block of wood, or any other kind of  
“ suitable brake, to be acted upon through the medium of  
“ the drums by means of the backward pressure of the ordi-  
“ nary buffing apparatus, or otherwise to be brought into  
“ action by the reversed action of the propelling power, and  
“ the same brake may also be so arranged as to be brought  
“ into action by the ordinary hand apparatus, if required.  
“ The carriage may run either end foremost, the spring catch  
“ (which may be adjusted almost by a touch) at the com-  
“ mencement of the journey being set accordingly; should  
“ this act, however be omitted, the carriage will still run as  
“ usual, and no further inconvenience will result than that  
“ the brake will not act until the catch be properly adjusted.  
“ The buffer rods are so constructed as to exert upon the  
“ brakes such an amount of pressure only as they can safely

“ bear without breaking ; when such pressure is exceeded,  
 “ the excess is diverted from the brakes entirely to the buffer  
 “ springs. It is evident that while the carriage is advancing,  
 “ and the spring catch of the drum is in contact with the stop  
 “ on the running wheels, they will be compelled to revolve  
 “ in a forward direction together, and when the brake presses  
 “ upon the drum, the same effect will be produced through  
 “ the medium of the drum in stopping the carriage wheels as  
 “ though the brake operated in the ordinary manner directly  
 “ on the running wheels. When the carriage has been  
 “ brought to a state of rest by the operation of the brake, it  
 “ may be immediately backed in the ordinary way by force,  
 “ still pushing against the buffers, the spring catch of the  
 “ drum not preventing the backward motion of the running  
 “ wheels, the stop on them being released from the catch by  
 “ such backward motion. On the withdrawal of the pressure  
 “ against the buffers, the recoil of the buffer springs will  
 “ release the brakes, and the wheels will be free to move  
 onwards as before.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1858, February 6.—No. 224.

WHITE, WILLIAM, and PARLBY, JOSIAH.—Improvements in  
 the preparation of carton pierre, papier mâché, &c. The im-  
 provements consist in producing the effect of inlaid colours,  
 by moulding the material in properly shaped moulds. The  
 colour is first applied when required to the mould, by means  
 of a brush and the whole is then backed up in the usual way.  
 The material so prepared is mentioned as applicable to car-  
 riages.

[*Printed, 4d. No Drawings.*]

A.D. 1858, February 10.—No. 247.

RICHARDSON, GEORGE, and RICHARDSON, WILLIAM.—  
 Three-wheeled carriages and omnibuses. “This invention  
 “ consists in putting three wheels to carriages, namely, two  
 “ wheels in the front part of the carriage in the usual manner  
 “ and one wheel on the hindermost part, near the centre.”  
 “ Passengers can pass into and out of the vehicle from the  
 “ sides or ends, and the said carriage can be built with self-



“ acting side doors, or in the usual manner of putting doors,  
“ and round or partly round the carriage will be placed steps,  
“ and the hindermost wheel will be covered from view, ex-  
“ cept that portion which is on the ground, as the upper part  
“ will work in or near the centre, and can be made any  
“ reasonable size according to the requirements of the vehicle.  
“ The wheels when made will be built (if necessary) with the  
“ spokes attached to the box at an angle of 45 degrees, and  
“ the end of the spokes that are placed in the box to be  
“ bedded in india-rubber, or any other elastic substance,  
“ which will prevent the splitting of the box, as is the case in  
“ too many instances with the wheels as now made, and the  
“ box of the wheels to be solid, and the axles fixed (when  
“ necessary) to the ends, and not placed as now in use,  
“ videlicet, through the centre of the box. The springs will  
“ be made of air and water confined in iron or any other  
“ metal or substance that will stand pressure, and of any  
“ size according to the requirement.”

*[Printed, 3d. No Drawings.]*

A.D. 1858, February 15.—No. 285.

TALL, JOSEPH.—Perambulators. “ This invention has for its  
“ object improvements in that description of carriages called  
“ perambulators. For these purposes the body of the carriage  
“ is constructed in such manner as to admit of being ex-  
“ panded and contracted according as it is desired for the  
“ time being to carry one or two children. In order to  
“ accomplish this object the body is formed in two parts,  
“ which are arranged in a suitable manner to allow of the  
“ sides being slided one towards the other when the carriage  
“ is to be used for one child, and to be slided from each other  
“ to the greatest extent when it is desired to use the carriage  
“ for two children. The stuffed seat and the cushion at the  
“ back for each carriage are made in two parts, and an addi-  
“ tional cushion is introduced in the centre when the two  
“ sides of the body are separated as far as they will go; or  
“ the stuffing and seats may be otherwise formed. The  
“ wheels and axle are by preference arranged as if the body of  
“ the carriage were intended to be suitable for only one child,  
“ and the sides of the body are suitably formed to admit of

“ the wheels turning freely when the sides are separated as  
“ far as they can go from each other. The riser of the seat  
“ and the footboard are made to slide one part within the  
“ other to correspond with the seat of the carriage.”

[*Printed, 6d. Drawing.*]

A.D. 1858, February 17.—No. 302.

HEYNS, PATRICK.—Wheels and axleboxes. This invention which relates to a method of building up or putting together wheels, and to a form of axlebox, including arrangements for lubrication, is thus described by the patentee:—“ My improved construction of wheel consists in forming the hub of plate iron or other metal. These hubs are made in two parts, the one being provided with a number of radial recesses into which the inner ends of the spokes, which are made of wood, are driven. When in position the second portion of the hub is brought up to the first, so as to bear against the sides of the spokes contained within the recesses, and bolts are passed through the whole and through the centre of each spoke, so as to secure the whole together. The felloes and tires are then fitted on in the ordinary or any other manner so as to complete the wheel. In some cases I propose to substitute for the spokes a disc of sheet metal or other suitable material, the inner or central portion being held between the two halves of the hub, whilst the periphery is secured in any suitable manner to the rim or felloe of the wheel, thus producing a solid instead of an open wheel. Suitable apertures may, however, be cut out of the plate for the purpose of giving increased lightness and elegance to the wheel. The improved axlebox is made in two halves, so as to open longitudinally or in the direction of the axle journal, and an annular recess is formed in the interior of the axlebox for the purpose of receiving a corresponding collar formed on the axle journal. It will thus be obvious, that on bolting the two halves of the axlebox together, the journal will be effectually retained inside by reason of the projecting collar. This axlebox may be adapted either to an ordinary wheel or to wheels of my improved construction, as herein-before described.”

[*Printed, 10d. Drawing.*]

A.D. 1858, February 19.—No. 315.

BEATTIE, JOSEPH.—Improvements in locomotives, &c. parts of which are applicable to other purposes. A large part of this invention relates to the construction of boilers and engines. The patentee also constructs axles of iron bars fagotted and welded so as to form a tube or solid. The axle bearing is divided vertically, the pair being externally cylindrical. The seating for them is bored out of the chamber for the reception of oil and cotton. The bearings may however be flat at the sides and also divided horizontally. The axle-box is divided vertically. Expansive rings of coiled wire lapped with wick are used for axle collars. The collar may also be formed of two rings or discs with an expansive ring between them; or suitable packing may be placed between the ring guards. Various modifications of the elastic ring are described. The cotton is placed on a loose perforated bottom in the oil chamber and pressed by springs against the journal; or the cotton may be arranged as a brush. In some cases there may be an oil box at the top with a gauge bottom. "Loop guards or straps" may be placed round the axles to allow for the play of the springs, "but as nearly in contact with the under side of the axle as may be desirable" and attached to the framing "so that they may be suspended in case of breakage." The patentee also forms box linings "to contain the upper parts of the wheels, so as to allow a working liberty, but prevent them falling in case of the axle breaking."

[*Printed, 2s. 5d. Drawings.*]

A.D. 1858, February 19.—No. 320.

MAW, EDWIN.—(*Provisional protection only.*)—Iron wheels. "This invention has for its object improvements in the manufacture of iron wheels. For these purposes the outer rings or felloes are of angle iron, with or without flanches or flanchd tyres, according as the wheels are to run on railways or other roads. The bosses or naves are constructed by casting on discs of wrought iron, which project beyond the cast iron in such manner as to have spokes fixed thereto. The spokes are of angle iron, and the ends are respectively fixed to the webs of the outer rings and to the

“ projecting parts of the wrought iron discs of the naves or  
“ bosses, and such fixing of the spokes is by preference by  
“ rivets or bolts.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, February 23.—No. 356.

BOYDELL, JAMES.—(*Provisional protection only.*)—Turning curves. “ This invention is more particularly applicable to  
“ locomotive carriages which run on common roads, and  
“ which have to turn within a short space. Locomotive car-  
“ riages of this description have sometimes been so arranged  
“ that the driving wheel on one or other side of the carriage  
“ may be thrown out of gear when going round a sharp curve,  
“ but this arrangement is open to serious inconvenience.  
“ Now, this invention consists of lifting one of the driving  
“ wheels off the ground (or easing its pressure on the ground)  
“ when the carriage is turning round. For this purpose a  
“ strong arm is mounted on each side of the carriage, turning  
“ at its upper end on a centre fixed to the frame; on the  
“ lower ends of these arms small wheels or rollers are  
“ mounted, and when it is desired to turn the carriage one  
“ or other of these arms is forced down by a screw or other  
“ mechanical means, so as to lift one of the driving wheels  
“ sufficiently to allow it to slip freely on the ground while  
“ going round the curve.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, February 24.—No. 367.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Weighing apparatus for carts, &c. “ This invention consists in the  
“ employment of a system of levers and a frame applied  
“ between the body of a cart or other vehicle and its axle or  
“ axles, and combined with a scale beam or steelyard attached  
“ to the body in such a manner as to weigh the load upon the  
“ vehicle. It further consists in a contrivance for securing  
“ the body of the cart firmly to the axles when the weighing  
“ apparatus is not in use, and for bringing the cart body and  
“ weighing apparatus into an operative relation, and when  
“ the weighing is to be performed. The system of levers by  
“ which the weighing is effected does not interfere with the

“ tilting of the cart to discharge the load, as when the body  
“ is locked to the scale frame, the said scale frame and the  
“ whole system of levers and the cart body are allowed to tilt  
“ together when the front of the cart body is detached from  
“ the shafts, the axles turning in the wheels as in the tilting  
“ of a common cart. To permit the weighing operation,  
“ however, the front of the body must not be connected  
“ directly to the shafts to prevent the tilting, as is the case  
“ in a common cart, but the connection must be made by  
“ means of the scale frames. A convenient means of connection  
“ between the scale frame and shafts consists of a cranked  
“ lever fitted to turn loosely on the front end of the shaft,  
“ and having attached to it two bolts, which are arranged to  
“ slide through corresponding holes in the shafts and in the  
“ front portions of the side pieces of the scale frame. By  
“ moving this cranked lever in one direction the bolts are  
“ shot into the holes to lock the scale frame to the shafts,  
“ and by moving it in the other direction the bolts are drawn  
“ to release the frame and permit the tilting. The invention  
“ is applicable to wagons or other four-wheeled vehicles as  
“ well as to carts or two-wheeled vehicles, the scale frame in  
“ four-wheeled vehicles requiring to rest upon the front axle  
“ as well as to be attached to the rear one, and the arrangement  
“ of the system of levers and scale beam or steelyard  
“ may be precisely the same in a four-wheeled vehicle as in a  
“ two-wheeled vehicle.

[*Printed, 7d. Drawing.*]

A.D. 1858, February 24.—No. 371.

MILLER, ROBERT FREDERICK.—Omnibuses. The improvements consist in “ giving much more room and greater comfort to the passengers by allowing them to sit in a circle,  
“ one passenger sitting in a recess in the front ; greater width  
“ being attained by carrying out the sides of the omnibus  
“ with circular bent timber, doing away with the front pillars  
“ and scroll end, thus giving more room for the passengers to  
“ sit round, and allowing eighteen inches extra width for the  
“ legs of the passengers, and in the construction of the front  
“ ‘rockers’ these being cut away, and the front made of  
“ circular iron plate, or other metal, the windows being made

“ of bent glass carried over the side rails and wheels. The  
 “ bottom sides are carried over the front carriage, to take the  
 “ bearings of the beds, &c. instead of at the bottom, as in  
 “ other omnibuses. The cant rails and side rails, panels, &c.  
 “ are carried with bent and other timber from the middle of  
 “ the omnibus, or thereabouts, to the front boot pillars, or  
 “ continued round the front of the omnibus, that is from the  
 “ middle pillar or pillars on one side of the omnibus to the  
 “ middle pillars on the reverse or opposite side, thus con-  
 “ tinuing them all round the front of the omnibus. The  
 “ carriage of this omnibus is constructed on an improved  
 “ principle, the dumb springs being made with branches, so  
 “ as to give better lock in turning the omnibus; the ends of  
 “ the futchells are done away with, and the perch bolt made  
 “ to work at the back of the beds, the wheel plate being made  
 “ to pass through the front circular plate.”

[*Printed, 5d. Drawing.*]

A.D. 1858, March 2.—No. 407.

SKELLY, JOHN.—Carriage springs. The springs described in this specification are almost all constructed upon one principle. This consists in using a light spring or a jointed bar, the horns or ends of which are connected by a rod furnished with a spiral spring. The tendency to open out of the spring or bar throws work upon the spiral, or india-rubber buffer which may be substituted for the latter. Many modifications are shown. There is also described a method of hanging carriages upon crossed springs.

[*Printed, 7d. Drawing and Woodcuts.*]

A.D. 1858, March 3.—No. 417.

GAUTROT, PAUL JOSEPH.—(*Provisional protection only.*)—Tent for outside seats of omnibuses. A pair of uprights supports the rollers upon which the awning is wound. The uprights have within them sliding racks, worked by a winch. These racks have attached to them the frames or stretchers of the awning; and when raised or lowered, cause the awning to be spread or closed. A spring is fitted to the rollers for winding in the awning. The end of the roller case serves as a name or index board for the omnibus.

[*Printed, 5d. Drawing.*]

A.D. 1858, March 6.—No. 456.

WHYTOCK, ANDREW.—(*Provisional protection only*).—Portable railway. “ This invention has for its object improvements in apparatus to be applied to wheels to facilitate them in travelling on common roads and other surfaces. “ Heretofore apparatus has sometimes been applied to wheels “ to prevent them from sinking into the surface on which the “ wheel is travelling, and to provide a more uniform surface “ for the wheel to run on, and this apparatus has usually consisted of a series of sleepers or supports laid continuously “ in front of the wheel, and on to which the wheel runs.

“ In arrangements of this description the wheel bears only “ on one of the sleepers or supports at a time, except just “ when it is in the act of passing from one sleeper or support “ to another ; consequently, when these happen to be placed “ on different levels (as must be frequently the case when “ the wheel is passing over a rough road) the wheel passes “ with more or less suddenness from one level to another. “ Now, according to this invention, the apparatus is so arranged that the wheel does not run directly on the supports, “ but upon links by which the supports are connected together ; thus the wheel is at all times supported by two “ neighbouring sleepers or supports (except when it is just “ over the centre of one of them) so that it, by a gradual “ incline, passes from the level of one to the level of the “ other.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, March 10.—No. 483.

BEALE, BENJAMIN.—(*Provisional protection only*).—Shaping spokes. The following is the inventor’s provisional specification:—“ My invention consists in mounting one, two, or “ more spokes excentrical, that is, with the centre of the “ spokes excentrical, to the centre of a drum or frame, and in “ causing that drum to revolve against fixed cutters or cutting “ or shaping tools, or in causing cutters or tools to revolve “ round the drum.

“ I cut the tenons at the nave end of the spokes, and complete the shaping of the spoke by setting a number of the “ spokes upon a drum or revolving frame at a proper angle,

“ and running suitable tools round the drum, or in causing  
“ the drum to revolve against fixed tools.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, March 18.—No. 554.

ANDERSON, SIR JAMES CALEB.—(*Provisional protection only.*)  
—“ Improvements in locomotive or other carriages.”

This invention consists, firstly, in an arrangement of steam chamber above the boiler, so that the latter may be kept full of water and thereby prevent uncovering of the tubes or fire box.

Secondly, in causing wheels of various kinds of vehicles to run inside larger wheels, which thus serve as portable roads or railways, which may be grooved, flanged, cogged, lined with wood, or otherwise contrived.

Thirdly, in making the exhaust steam transparent, and

Fourthly, in placing the engineer in front of the steam carriage so as to have full view of the road. The fireman is placed in rear.

[*Printed, 3d. No Drawings.*]

A.D. 1858, March 27.—No. 653.

WELCH, JAMES.—Endless or portable railways. “ The rail-  
“ ways are used one on each side of the carriage, and are  
“ each composed of an endless chain of rails of a suitable  
“ length jointed together. The bearing wheels of the car-  
“ riage which run upon the railways are each a double wheel  
“ having a flange inside and outside, and are composed of  
“ two sets of spokes and felloes with an interval between each  
“ set. Each of the railways is supported and guided round  
“ the bearing wheels by two wheels or drums placed ante-  
“ riorly and posteriorly between the sections of the double  
“ bearing wheels. The drums run best as near to the ground  
“ as practicable, and their axles are secured to the bottom of  
“ the carriage by clips elongated sufficiently to admit of their  
“ rising beneath the body of the carriage with the drums and  
“ chains over any usually large obstacle in the road. The  
“ distance of the drums from each other is capable of adjust-  
“ ment at pleasure by means of a screw, according to the  
“ length and required tension of the chain of rails. Each



“ link of the railway is composed of two parallel bars of iron  
“ having a space left between them, and firmly fastened at  
“ one end to a foot or shoe of iron and wood of a suitable  
“ length and breadth, according to the load and the nature of  
“ the ground, and at the other end to another piece of iron  
“ forming a joint with the foot of the adjoining link. The  
“ circumferences of the drums pass into the spaces left be-  
“ tween the parallel bars of the links, securing the rails in  
“ their proper position and supporting them at the joints  
“ during their progress round the carriage wheels. In order  
“ to enable the railway to circulate over the drums with some  
“ degree of speed, to obviate the violent blow occurring at  
“ the joints of the rails in their passage over the bearing  
“ wheel from one drum to the other, each of the pieces of  
“ iron before mentioned as composing a joint with the foot  
“ of the next link is formed with a tongue projecting for-  
“ wards beyond the joint of its own link between the parallel  
“ bars of the next adjoining link throughout or nearly  
“ throughout its whole length towards the next joint, the  
“ points of each of the tongues taking on to the forward drum  
“ at the antecedent joint of the chain, and conducting each  
“ link smoothly onward over the drum to the next joint in  
“ endless succession. With the same object, a portion of the  
“ foot of each link also projects backward beyond its joint  
“ towards the next joint, and forms a rest for the succeeding  
“ link, which has the effect of easing them off the hinder  
“ drum, and preventing the depression of the rails between  
“ the drums on their forward passage over the bearing wheel.  
“ The drums may be covered with any suitable soft or elastic  
“ substance, or an endless rope or chain passing in a groove  
“ over both drums may also be used in like manner for sup-  
“ porting the links and preventing concussion and noise.  
“ When the carriage is locomotive the railway may be fitted  
“ with a toothed rock attached to one side, adapted to a pinion  
“ driven by the motive power.”

[*Printed, 10d. Drawing.*]

A.D. 1858, March 31.—No. 685.

CROKER, BLAND WILLIAM.—(*Provisional protection only.*)—  
Lubricating axles. The object of this invention is “to lubri-  
“ cate the axle boxes of locomotive engines, tenders, and of

“ railway and other carriages and vehicles, without using  
 “ packing, sponge, or other similar substances for retaining  
 “ the oil, grease, or other lubricating matters intended to be  
 “ applied to the bearings. For this purpose ” the inventor  
 attaches “ one or more circular discs or plates to the outer  
 “ end of the axle, either flat against the same or secured by  
 “ studs. These discs or plates dip into the oil and revolve  
 “ in an oil chamber while the carriages are in motion,  
 “ and by these revolutions convey oil to the axle step, or  
 “ bearing, without the intervention of any kind of sponge or  
 “ packing.”

[*Printed, 6d. Drawing.*]

A.D. 1858, April 10.—No. 776.

OXLEY, JOHN.—“ Improvements in the doors and sashes of  
 “ carriages.”

These improvements consist, firstly, in fitting to windows  
 or doors, a frame containing pads of india-rubber or other  
 suitable elastic substances, for the purpose of preventing  
 vibration or concussion.

Secondly, in attaching to the window such a pin which  
 slides in a groove cut in the larger groove of the sash frame.  
 When the window sash is raised to close it, the pin is forced  
 forward into another groove cut in a brass plate in an inclined  
 direction. This groove forces the pin and the sash forward so  
 that the latter presses tightly against the frame.

Thirdly, in inserting elastic washers into the knuckle joints  
 of hinges to compensate for wear and to prevent vibration.

[*Printed, 7d. Drawing.*]

A.D. 1858, April 13.—No. 799.

AYSHFORD, THOMAS BLAKE.—(*Provisional protection only.*)

—Omnibuses. The inventor, describing his improvements,  
 says : “ the seat which usually runs along the roof of the  
 “ omnibus, and is commonly called the ‘ knifeboard,’ I divide  
 “ into compartments or separate seats by a rail of timber,  
 “ iron, or other suitable material at any convenient distance  
 “ from the seat itself. This rail I construct in a zigzag or  
 “ serpentine form, so that each passenger is divided from his  
 “ neighbour by such rail, and obliged to sit in an opposite

“ direction.” “ In this way I not only obtain more comfort and convenience for each passenger, but also bring the top weight more directly into the centre of the vehicle. In front of each seat I also form a small foot board, in such a position as to give more comfort to the passenger occupying such seats, and also allowing a clear and unobstructed gangway for the purpose of enabling the other passengers to pass and repass without interfering or annoying those passengers who may be seated. The front portion of the omnibus I form by cutting off the corners, giving it an appearance of three sides of an octagon. Over the part forming one corner or side of the octagon, on either side of the omnibus, I place a seat, receding back from the other, or two centre seats, a suitable distance, to suit circumstances. The whole of these seats I divide separately by means of a rail made of any suitable material, which gives each passenger his proper share of room. By the arrangement of keeping back the two outside seats, more room is given at the two ends of the footboard, and any passenger ascending or descending is not obliged to inconvenience himself or the outside passenger, as is now generally the case in carriages or omnibuses of the present construction.”

*[Printed, 3d. No Drawings.]*

A.D. 1858, April 23.—No. 903.

LUNGLEY, CHARLES.—Portable boats. This invention relates to the construction of iron boats which will admit of being taken in pieces for transport.

Such boats may also be fitted with wheels, either flanged, grooved, or plain, so that they may be used if desired as land carriages. For these purposes trunks or compartments are constructed in which are fitted frames carrying wheels with their bearings and springs, the whole of which can be raised or lowered by screws as desired.

*[Printed, 1s. 4d. Drawings.]*

A.D. 1858, April 30.—No. 963.

DE BRUN, BENJAMIN EDOUARD GUYOT.—Waterproof cloth or artificial leather. This material, which is claimed to be

useful for carriage purposes, is made by coating the fabric with a mixture of linseed oil, litharge, brown umber, and protoxide of manganese. Lamp black is then applied. The fabric is then varnished with a mixture of "common oil, brown umber, litharge, prussian blue, and turpentine," and it may subsequently be grained by rollers.

[*Printed, 3d. No Drawings.*]

A.D. 1858, May 6.—No. 1004.

DAVIS, MARCUS.—Carriage wheels and skids. The wheel, constructed "without the usual iron tyre, in its periphery is made a receptacle of an inverted rounding or semicircular figure, and in the bottom of this receptacle a groove is made; a ring or band of vulcanised india-rubber, or composition, or combination of india-rubber, is made to fit into the receptacle on the periphery of the wheel and into the groove made therein and thus form the tyre of the wheel to traverse the road; or a tube of rubber, canvass, leather or similar material may be used instead of the solid band, and filled with cork; or cork may be put in the receptacle or groove formed in the periphery of the wheel and be covered with rubber, canvass, leather, or other suitable material, and thus form a tyre; or, a layer of cork may be inserted in a groove in the periphery, and an iron or steel tyre put over the cork, and this tyre may be reduced in substance at intervals so as to give it elasticity. The felloes are faced with plates of iron or other suitable metal.

"Skids for wheels, as above described," are made "with a hollow or false bottom to keep the heat from the rubber or other material. If the plates are made of bright metal" the patentee makes "a pair of buffs to compress the sides of the wheel, with a friction roller to bear on the tyre and polish the plates by causing the wheel to revolve rapidly through the buffs."

[*Printed, 6d. Drawing.*]

A.D. 1858, May 7.—No. 1020.

CASTLE, JOHN.—Brakes. This invention is clearly summed up under the following heads:—

"First, a rod jointed in such a manner as will permit it

“ to revolve in its whole length when turned at one end,  
“ notwithstanding that certain parts of this said rod be curved  
“ longitudinally when applied to the working of a brake for  
“ retarding the motion of wheels of carriages on ordinary  
“ roads.

“ Secondly, a nut, herein called a traversing nut, jointed  
“ or otherwise connected to the lever or levers of a brake, and  
“ arranged to work the same by the revolving of a screw on  
“ which it is placed.

“ Thirdly, two screws or threads and traversing nuts on the  
“ same rod, arranged to work the levers of a brake in opposite  
“ directions at the same time.

“ Fourthly, an arrangement for working a brake by a handle  
“ or handles from one or both sides of a vehicle ” by means  
of bevel gearing upon the handle shaft and the brake rod.

[*Printed, 8d. Drawing.*]

A.D. 1858, May 8.—No. 1036.

NEWTON, ALFRED VINCENT. — (*A communication.*) — Fabric for carriage panels, &c. This fabric consists of wire cloth or pierced sheet metal coated on both sides with “india-rubber” “vulcanite.” If a smooth surface is required the fabric is moulded between glass of polished plates of metal.

[*Printed, 4d. No Drawings.*]

A.D. 1858, May 26.—No. 1183.

COWAN, WILLIAM. — (*Provisional protection only.*) — Disengaging horses. “ According to one modification of apparatus  
“ there is fitted up in the centre of the front of the vehicle a  
“ vertical lever, set upon a stud centre, low down, and  
“ arranged so as to have a transverse vibratory traverse. This  
“ lever may be conveniently carried either inside or outside  
“ the front splash board or guard. It has, at its lower end, a  
“ segmental toothed rack in gear with a transverse horizontal  
“ rack formed upon the actual disengaging bar. Each end  
“ of this rack bar is formed with an underneath elbow piece,  
“ terminating in a small stud. These terminal studs fit  
“ into the double eyes usually formed upon the splinter and  
“ cross bars of carriages, taking the place of the ordinary

“ joint studs employed for connecting the shafts to the bars  
 “ for single harness work. And similarly for double harness  
 “ they fit into double eyes on the cross bar, to which the  
 “ splinter bar for the traces is attached by corresponding  
 “ single eyes. In this way, whenever it is necessary to  
 “ disengage the horse or horses, the driver has merely to  
 “ work the actuating lever across from one side to the other,  
 “ when the attaching studs are at once traversed out of their  
 “ eyes, and the shafts or splinter bar are released, allowing  
 “ the horse or horses to go freely away. To allow the pole in  
 “ double harness to get freely away also, provision is made  
 “ for its simple attachment to the splinter bar, so as to let  
 “ both go together. This general system of disengagement  
 “ may be carried out in various other ways, as, for example,  
 “ by means of a plain lever working in a slot in the bar to be  
 “ released, or by a chain or strap pulley arrangement, but  
 “ the arrangement herein-before described is preferred.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, May 31.—No. 1220.

THORNBUR, JOHN BARKER. — Perambulators and invalid carriages. The invention chiefly consists in the mode of applying a cover to vehicles of the above description. The body is semicircular in section and has a space between the framing into which shuts down a hood or covers of leather or other material. The sides of the covering are made of semicircular glazed flaps. The hood draws up from the containing space, over the top, either partially or wholly. The seats of the vehicle are hinged and so arranged as that the vehicle may be double seated or have one seat and a foot rest, or be fitted for reclining.

[*Printed, 9d. Drawing.*]

A.D. 1858, June 4.—No. 1263.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—(*Provisional protection only.*)—Fibre for stuffing carriages, &c. The invention consists in preparing the fibre of “the musa, “the aloe, the agave, the corchorus fuscus, the corchorus “juncus, the corchorus olitorius, the corchorus capsularis “and the palm leaf” for the purpose of using the same or

not in combination with other fibres for stuffing carriages and other articles.

“The fibres are first cut,” says the inventor, “into lengths of from about one foot to eighteen inches; I then card such material in a carding engine, and purify and bleach the fibres by subjecting them to a chlorine bath of the strength of 3° to 4° Beaumé, with a small addition of muriatic acid. After the fibres have remained for about 3 hours in the bath they will be found sufficiently bleached. It is necessary then to wash them in clear water saturated with a few drops of sulphuric acid, after which they are to be dried. The fibres are again carded in a carding engine finer than that previously used, or they are curled in a manner similar to that followed in the curling of horse-hair. After having been subjected to the mechanical and chemical operations above described, the fibres will be converted into a wool-like material, well adapted to all purposes of stuffing.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, June 7.—No. 1276.

SCOTSON, EDMUND, and CHARNLEY, HENRY.—(*Provisional protection only.*) — Endless railway and connecting driving wheels. The first part of the invention consists in mounting the driving wheels of traction engines on separate axles, each axle being in gear with the driving shaft of the engine by means of fast and loose open wheels and a clutch box. By means of this arrangement, the wheels may turn, if necessary, in opposite directions.

The second part “consists of the following arrangement of mechanism forming an improved endless railway to be used in connection with such engines. Around the outer periphery of the locomotive wheel” is formed “a groove in which an endless chain is placed, such chain being loose on the wheel and carried round with the wheel by means of studs attached to the wheel, and taking into the links, or the chain may be made fast to the wheel. This chain at intervals is furnished with flat V-shaped studs projecting outwards. Each of these studs carries a lozenge-shaped piece forming a section of the rail. These lozenge-shaped pieces (which are

“ made by preference of wood with iron plates bolted across at intervals) are entirely disconnected with each other, and are connected to the chain only by the before-mentioned flat V-shaped studs each of which works in an iron box or slot let into a section of the rail. The end of the stud is furnished with a transverse projecting pin, which prevents the stud from being entirely withdrawn from the slot, and causes it to lift the lozenge-shaped section of the rail, as soon as the wheel is clear of it.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, June 16.—No. 1368.

STEVEN, THOMAS. — Making moulds for casting. “ In making moulds for axle bushes for cart wheels according to the third part of the invention, metal rings or plates are placed in the moulds at the parts corresponding to the ends of the bushes, the object being to chill the cast metal at these parts, and thereby produce a better wearing surface, and one requiring less finishing than in bushes cast in moulds as ordinarily made. When a metal mandril is used in these moulds, there may be substituted for one of the rings for chilling the ends of the bush a collar or shoulder formed or fixed on the mandril itself.”

[*Printed, 7d. Drawing.*]

A.D. 1858, June 25.—No. 1434.

BOOTH, THOMAS.—(*Provisional protection only.*)—Axle boxes and antifricition axles. The inventor says: “ I fit the axle loose in its bearings, these bearings consisting of a number of rings placed one within the other. The smaller ring or bearing surface with which the axle is in immediate contact is fitted closely to the axle; the next ring is somewhat larger than the small one, so that it has considerable play within it; the third ring is similarly adapted to the outer diameter of the second ring and so on are the several rings disposed and fitted within each other; the outer ring constitutes a fixed bearing surface fixed to the carriage frame. The fixed bearing has annular plates fixed to it which partially enclose the sides of the several rings and keep them in position; two other annular plates



“ are secured to the axle which encloses the sides of the  
“ smaller rings and embraces or overlap the larger annular  
“ plates, thereby keeping the whole of the bearing rings in  
“ position; suitable stop collars or other parts are affixed to  
“ the axle for securing the several parts in position.

“ My improvements in mounting and fitting wheels to axles  
“ consist of a similar arrangement of rings placed one within  
“ the other, the axle being free to rotate within the smaller  
“ ring or bearing surface which is of considerable thick-  
“ ness; a series of rings surround this bearing surface,  
“ which are all received and enclosed within annular plates  
“ fixed to each side of the wheel; between the annular plates  
“ and these rings I dispose annular surfaces of india-rubber as  
“ cushions to receive any side shocks; a plate of metal is inter-  
“ posed between the india-rubber and the rings as a friction  
“ surface;” there are secured to the axle other annular plates  
which embrace the annular plates fixed to the wheel: the  
wheel is thereby “ kept in position laterally with regard to the  
“ axle; suitable collars, caps, and stops are fitted to the axle  
“ to secure the several parts in their proper position.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, June 30.—No. 1473.

CAPSTICK, WILLIAM.—(*Provisional protection only.*)—Metal wheels. The nave is fitted “ with a bush of cast or wrought  
“ iron, brass, or other metal, which when placed in the nave  
“ is secured therein by keys or wedges, so as to admit of its  
“ being taken out and replaced by a new one in case of  
“ breakage or injury. Instead of an ordinary linch pin to  
“ retain the wheel on the axle, a round head or cap piece is  
“ placed on the end of the axle, and prevented from turning  
“ round thereon by means of a feather or cross bar on the  
“ inside of the cap piece, which is fitted in a groove or trans-  
“ verse slit cut out of the end of the axle, on which it is  
“ secured by means of a stud screw which passes through the  
“ cap piece, and enters the end of the axle. Sometimes  
“ instead of making the wheel wholly of metal” the inventor  
makes the “ nave of metal in the manner just described and  
“ adapts thereto wooden spokes and felloes.

“ In making a wheel composed entirely of wrought iron,  
“ the spokes are welded on to the naves of the wheel, and the

“ rim or tread is then in sections welded on to the spokes, afterwards the sections of the rim or tread are welded together, and the wheel is complete for tiring or hooping.

“ In constructing wheels of wrought and cast iron combined, the spokes and rim being wrought iron, and the nave of cast iron, the rim and spokes are welded together, and the nave is cast on afterwards, then the wheel is tired or hooped, and a loose bush of any size required, is fitted into the nave, and secured therein in the manner already described.

“ The wheel may be held on to the axle by means of the ordinary linch pin, or by means of a cap piece and stud bolt as above mentioned.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, July 1.—No. 1480.

RIDDELL, THOMAS.—Omnibuses and brakes. This invention, says the patentee, “ relates, firstly, to a novel construction of omnibus body the chief object being to provide accommodation for first and second class inside passengers. The body I form by preference of two octagonal compartments, which are separated by a vertical partition. To the hinder compartment access is gained by a door at the back, as is usual, but for the front compartment a side door is provided in the angle formed by the two octagonal figures. In the opposite angle I fix steps which will render the roof seats more easily accessible than hitherto.”

A self acting brake is used which “ consists of a rocking frame having (for convenience) one of the carriage axles as its fulcrum ; connected to the upper part of the rocking frame is a sliding bar plate or frame which carries the trace irons and this sliding bar or frame is connected by springs of vulcanized india rubber to the under framing of the carriage, the sliding frame has therefore always a tendency to be drawn in the direction that will force the brake surface carried by the lower end of the rocking frame into action. In order, however to keep the brake out of action I provide a trigger or spring catch, which is attached to the framing of the carriage and bearing against a projection or other part of the sliding frame, will prevent it from yielding to the drag of the break springs. By releasing

“ this catch from its hold on the sliding frame, which the  
“ driver might do by a lever or strap at the time that he  
“ pulls up his horses, the break would come into immediate  
“ action and put the required drag on the carriage. It will  
“ be obvious that this arrangement of break may be applied  
“ to the retarding or stopping of carriages generally. When  
“ applying this break to a waggon, I propose in place of  
“ a holding or trigger catch to keep it out of action by means  
“ of a chain barrel, which may be turned by a handspike or  
“ otherwise, when the break is required to be lifted out of  
“ action and caused to hold the lifting chains in tension  
“ until the break is to be used. This like the former arrange-  
“ ment admits of being thrown in and out of action while  
“ the vehicle is in motion.”

One of the brakes shown in this specification acts on the ground; another is applied to the wheels. This latter is worked by the weight of the conductor on his footboard.

[*Printed, 9d. Drawing.*]

A.D. 1858, July 9.—No. 1551.

ROWAN, JOHN MARTIN.—(*A communication.*)—Wrought iron wheels. This invention relates to a method of manufacturing welded bosses of iron wheels and it also includes an arrangement of heating furnace. It consists in the first place “in  
“ making the butts of spokes for the hubs of wrought-iron  
“ wheels of an angular, curved, or zig-zag form so as to insure  
“ a lap welded hub. The butts are made the entire width  
“ sufficient to form a hub without the use of washers, as in  
“ the ordinary way. These butts are forged to the required  
“ shape, with dies under a tilting hammer, and when the  
“ sections are thus forged, they are secured by a band or  
“ clamp provided with set screws, or any convenient contri-  
“ vance in general use for similar or analogous purposes.  
“ When the rough hub is formed of these sections in number  
“ sufficient to form a hub, it is placed in between the nozzles  
“ of a heating apparatus for the purpose of being heated to a  
“ sufficient degree of heat, to be welded into a solid hub  
“ by the swaging action of dies corresponding to the  
“ intended shape of the hub and spokes. The dies for  
“ swaging and hammering the hub (when at a welding heat)

“ are alike, the lower one being secured to an anvil, and the  
 “ other arranged above it, and acting as a vertical hammer ;  
 “ in each of the dies is a chamber or recess for the reception  
 “ of the hub, and radiating from this chamber or recess are  
 “ grooves to receive the arms of the wheel. As the upper  
 “ die constitutes the hammer or head of the vertical acting  
 “ hammer, it will by its action in combination with the  
 “ stationary lower die form the hub perfectly swaging or  
 “ hammering together the several parts.

“ By the form and action of the dies the hub is swaged  
 “ and compressed on all sides into shape and is soundly  
 “ welded together in die chambers. The wheel is turned  
 “ from time to time, so that both sides of the hub will be  
 “ subject to blows of the upper die or hammer. A punch is  
 “ driven through the eye or central opening of the hub to  
 “ aid in clearing the eye and shaping the hub.”

[*Printed, 1s. 5d. Drawings.*]

A.D. 1858, July 21.—No. 1648.

ALLNUTT, HENRY.—(*Provisional protection only.*)—“ A vehicle  
 “ for lamplighters.”

“ The object of this invention is to facilitate and expedite  
 “ the lighting, extinguishing, and tending of the public  
 “ lamps, and to dispense with ladders for such purposes.  
 “ The invention consists in constructing a vehicle in such  
 “ manner that a person stationed thereon may readily and  
 “ conveniently get at lamps (for the aforesaid purposes)  
 “ when driven alongside them. The vehicle consists of a  
 “ stage, platform, or standing place, mounted at such a  
 “ height on a carriage, travelling frame, or support, that  
 “ a person placed on it may easily reach the lamps. The  
 “ carriage, frame, or support, is carried on wheels, and pro-  
 “ vided with draught arrangements for horse traction. The  
 “ stage or platform should be suitably fenced, or have a rail  
 “ or appliance for steadying the lamplighter, and should be  
 “ so fitted as to yield and shift laterally or project more or  
 “ less sideways as desired. The vehicle may be driven  
 “ rapidly along the sides of the thoroughfare, and the lighter  
 “ expeditiously light, extinguish, and attend to the lamps.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, July 21.—No. 1649.

GILES, JOHN WHEATLEY.—Traction engines. This engine is propelled by means of props or pushers driven by gearing worked by a cranked axle. The gearing works propeller bars, to which the pushers are attached. Instead of attaching these pushers at the end of the body of the vehicle, they are placed so as to thrust near the centre of gravity. By this means the tendency to lift the vehicle is avoided. The pushers are provided with expanding and contracting feet, and there is also a provision for adjusting their length according to the nature of the ground to be traversed. The vehicle is steered by power applied to the two fore wheels which are mounted in a frame near together. A brake consisting of a friction band working round a ring secured to the wheel spokes is fitted.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1858, August 5.—No. 1779.

LUIS, Jozé.—(*A communication.*)—"A machine for drilling " and grooving the naves of wheels, and also to force the " axle box into the naves."

This machine, the exact nature of which it is extremely difficult to apprehend from the description contained in this specification, appears to be an adjustable screw frame for holding the nave, and a similar frame or holder for working the boring tool. The latter is capable of adjustment to the necessary angle for the cut, and in its place may be substituted screwing apparatus where such is required. The drawing is intended to show the operation of cutting a thread on the axle tree.

[*Printed, 6d. Drawing.*]

A.D. 1858, August 7.—No. 1799.

SMITH, JOHN, the younger.—Traction engines. This invention consists " firstly, in supporting the boilers of agricultural " steam engines and locomotives to be used on common roads " upon centres or upon an axis situated in an horizontal plane " and transverse to the length of the boiler. By this method " of construction the boiler may be preserved in a horizontal

“ position, while the framing of the engine is traversing an  
“ incline upon the land or road, and the water level in the  
“ boiler prevented from undergoing any material change.  
“ The force pump by which the boiler is supplied with water,  
“ and the pipe by which steam is supplied to the engine, are  
“ connected with the boiler through the axis or centres on  
“ which the boiler turns.”

“ Secondly, in connecting the wheels which constitute the  
“ driving wheels of the locomotive, or of the agricul-  
“ tural engine when the engine is made locomotive, to the  
“ axle or shaft by which they are driven in the following  
“ manner :—the wheels, instead of being keyed to the axle  
“ turn loosely thereon, but may be fixed and made to turn  
“ with the axle by means of a clip consisting of two semi-  
“ circles. The said clip is attached to the shaft or axle and  
“ encircles the nave of the wheel, when the clip is tightened  
“ upon the nave, the wheel is carried round on the rotation  
“ of the shaft. On turning curves or turning the engines  
“ round one wheel may be fixed and the other loose.”

[*Printed, 6d. Drawing.*]

A.D. 1858, August 12.—No. 1835.

MAISSIAT, JACQUES HENRI MARIE.—Wheels. To make an elastic wheel, the patentee uses “a cast metal nave of one  
“ piece, or of two pieces connected having in the direction of  
“ the radii mortices to receive and hold, in a secure manner,  
“ the thin elastic arms of the wheel. These arms are broad  
“ in the direction of the axis, very long, all curved in the  
“ same direction, and being fixed at several points with a  
“ junction of considerable length, one felloe, itself composed  
“ of layers of elastic plates conveniently connected, to which  
“ the springs themselves consist in constituting; the whole is  
“ surrounded with an iron tyre. The number of these plates  
“ can be increased to make them wider, longer, or stronger  
“ according to the necessity. The boss may be modified in a  
“ hundred ways. To make elastic arms, either steel or wood  
may be used, or the combination of metal and wood.”

[*Printed, 6d. Drawing.*]

A.D. 1858, August 13.—No. 1849.

RICKETT, THOMAS,—Endless railway. The patentee says,  
 “ the object of this invention is to facilitate the movement of  
 “ locomotive engines and other carriages, more particularly  
 “ over soft or uneven ground, by giving to them, through an  
 “ elastic medium, a more extended bearing surface on the  
 “ ground. For this purpose, in place of each driving or  
 “ main wheel, I employ two or more comparatively small  
 “ wheels or rollers placed equidistant longitudinally from the  
 “ central axis, and around those wheels I place an elastic  
 “ hoop or hoops of proportionally large diameter, made of a  
 “ thin plate or plates of steel, or combination of other  
 “ materials ; within this hoop the wheels roll, and in conse-  
 “ quence of the weight of the engine coming upon these hoops  
 “ at two or more points beyond the centre of bearing, the  
 “ hoop yields to the weight till the bearing points of the  
 “ rollers approach or touch the ground, by which means  
 “ that portion of the hoop between the bearing points becomes  
 “ nearly or quite flat, and the load is sustained by a portion  
 “ of ground approaching to the whole distance between the  
 “ centre of the rollers. As the engine or carriage progresses  
 “ the rollers revolve within the elastic flexible hoop, which, at  
 “ its upper parts, maintains a cycloidal form and produces a  
 “ continuous, extended, and elastic bearing for the engine or  
 “ carriage below and intermediate of the points of bearing of  
 “ the rollers or wheels.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1858, August 21.—No. 1902.

WALKER, GEORGE JAMES.—(*Provisional protection only.*)—  
 Funeral carriages. The following is the inventor's provisional  
 specification :—My invention, which has reference to improve-  
 “ ments in funeral carriages, consists in fitting or furnishing  
 “ chariots or other descriptions of mourning coaches or car-  
 “ riages with suitable arrangements for carrying or bearing  
 “ the coffin upon the roof thereof, for which object a sarco-  
 “ phagus shaped top or cover is employed in connection with  
 “ a shifting scroll iron step, together with fixed and move-  
 “ able rollers for raising or lowering the coffin, as required.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, August 27.—No. 1948.

FOWLER, JOHN, junior, and BURTON, ROBERT. Traction engines. “This invention has for its object improvements in  
“ the construction and arrangement of locomotive and other  
“ carriages, to facilitate their movement on common roads  
“ and other surfaces. For this purpose the axle (or it may  
“ be axles) of the carriage is supported at its ends by frames,  
“ and these are supported on wheels which run upon rails  
“ laid by the carriage in its progress. Each frame is furnished with two bearing wheels, one placed directly behind  
“ the other, so that both of the wheels on one side of the  
“ carriage run on one rail, and both of the wheels on the  
“ other side on another rail. The wheels have flanges on  
“ both sides of the tyre, and an endless chain of short sleepers  
“ or bearers, each having a length of rail bolted longitudinally  
“ to it, passes round each pair of wheels, and in order to  
“ prevent the endless chain from sagging in between the  
“ wheels, and to move the chain, it is preferred to employ a  
“ small supporting pulley, and to aid in regular laying of the  
“ rails in front of the bearing wheels, one of these has a  
“ toothed wheel formed on its side, or mounted on its axis,  
“ which gears with another toothed wheel on the axis of the  
“ pulley which supports the chain, as before mentioned, so  
“ that this pulley is driven at a surface speed equal to the  
“ speed at which the carriage is travelling. The turning of  
“ the carriage is facilitated by mounting the bearing wheels  
“ in the frame in such a manner as to allow of their traversing  
“ a distance sideways, or in the direction of their axles.”

[*Printed, 10d. Drawing.*]

A.D. 1858, September 1.—No. 1990.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—Springs. This invention “consists in forming a spring of a pile of steel  
“ plates or leaves, each plate of the pile being so bent as to  
“ form a series of reversed semi-ellipses. The plates are so  
“ piled one upon the other that the convex parts of one plate  
“ shall be in contact with the convex parts of its fellow and  
“ next adjacent plate, and vice versa, each leaf or plate  
“ forming several points of contact for the plate overlying it,



“ and thus disseminating through the pile both the lateral  
“ and vertical pressure upon the spring.”

[*Printed, 5d. Drawing.*]

A.D. 1858, September 3.—No. 1998.

ROBERTSON, JAMES.—Springs. A part of this invention relates to the construction of springs for various purposes, of corrugated metal. Almost every possible variety of application of corrugated metal is shown. The springs may consist of corrugated strips or plates arranged to act as tension springs ; or they may be placed so as to receive the strain by way of compression. Sometimes the plates are arranged in layers with the corrugations of one plate crossing the corrugations of another at right angles. Discs radially corrugated are also shown, as also corrugated bushes with which to surround shafts or axles.

[*Printed, 2s. Drawings.*]

A.D. 1858, September 4.—No. 2010.

HYDE, HIRAM.—(*A communication.*)—Springs. “ The curved  
“ leaves or plates of which the spring is composed are made  
“ of equal length, and to avoid friction they are separated  
“ from each other, except at their central parts and near  
“ their ends. At their centre, where a slight increase in the  
“ thickness of metal is provided, the naves are connected  
“ together by clamps and bolts, and at their extremities the  
“ metal is thickened to ensure a space between the leaves.  
“ Any given number of these leaves bent to the same curve  
“ may be provided to sustain the weight of a minimum load,  
“ and below these are other leaves (the curves of which vary  
“ and decrease gradually) to receive in succession the weight  
“ of the superincumbent load according as that load is  
“ increased, and an increasing elastic sustaining power is  
“ required. This spring is completed by placing beneath the  
“ pile of steel plates or leaves a curved bar of steel of greater  
“ strength, but of somewhat similar form, and of the same  
“ length as the plates, but having its ends curved downwards.  
“ The use of this bar is to permit of clamps being attached  
“ thereto which will hold down the lower layers of leaves,  
“ and allow of the free play of the upper leaves, while, at the  
“ same time, when the upper leaves are found unequal to

“ sustain the load, these lower leaves will (one or more) come  
“ into action, and receive and sustain the pressure of the  
“ load. The clamps are made of different lengths, and  
“ capable of fitting one within the other, their office being  
“ to hook on to the end of a leaf when it has been drawn down  
“ towards the clamp bar, and retain it in that position. By  
“ means of a set of these clamps, the lower leaves are there-  
“ fore held down, but when a pressure comes upon them from  
“ above, they are free to act (the clamps sinking with them),  
“ and severally afford their support as required to the load.  
“ When the clamps are used, the leaves need not be set to  
“ varying curves, as above mentioned. To secure the clamps  
“ more perfectly to the leaves, they are provided with studs,  
“ which take into holes made in the leaves, and as they will  
“ naturally preserve a vertical position, there will be no  
“ danger of their being accidentally disengaged from the  
“ spring.”

[*Printed, 10d. Drawing.*]

A.D. 1858, September 17.—No. 2102.

HADLEY, CHARLES. — “Improvements in omnibuses, cabs,  
“ railway carriages, waggon, and other similar vehicles.”  
This invention which is described at great length and under  
many modifications has reference to improvements in railway,  
as well as common road carriages, but a great many details  
are common to all kinds of vehicles. The invention partly  
consists in constructing vehicles with a lower centre of  
gravity than usual, in constructing an upper compartment in  
omnibuses, in giving a “circular or paracentral shape to  
“ the present cab body,” lowering the springs and fixing them  
“ in an inverted inclination underneath the nave and widen-  
“ ing the fore part of the body over them, and also employing  
“ shafts at either end;” in lowering waggon and cart bodies  
and making the openings or rolling ways at the sides. Some  
of the improvements are also applicable to children’s and  
other small carriages.

In some case a carriage is divided not only into two but  
into “a double or triple tier or series of horizontal, lineal,  
“ transverse, diagonal, or circular compartments,” with  
“ automatic and other stairs, steps, galleries, and other

“ methods of access to and from them,” and modes are described of curving and recessing the side beams of carriages, and forming the floor and other parts of “ rivetted or “ marine-glued planking or plates,” friction or concussion rollers being applied to the sides and angles of or under the body, the axle, cranks and springs being fixed “ within the “ thickness of and forming part of the sides.”

Hearses and mourning carriages are also constructed upon similar principles.

The invention relates also to modes of ventilating carriages by ingress and egress currents; of illuminating carriages, of conveying signals to the driver by bells, and of painting or staining the door or the body of each compartment of a carriage of a different colour in order to distinguish the class.

Other parts of the invention include a mode of curving the fore axle so as to allow the crosstree or body of a carriage to “ descend below without coming in contact with the axle,” curving the front axle around the end of the carriage, “ thus forming a substitute for the ordinary drawbar;” and a mode of constructing a metallic box nave, having its interior of one or more diameters, with an annular cavity and other arrangements for the purpose of lubrication; and a method of transferring weight in turning the fore carriage to one side upon the spring of the opposite side.

As regards springs, the invention consists in “ employing “ S or hook, scroll, ringlet, curl, fusee, double spiral, C, “ double C, < (V), > (U), screw, worm, corrugated, serrated, “ and other sinuous shapes, so as to decrease their length “ (lineally, but to increase them vertically), and still retain “ their elasticity, and employing them to act by compression “ or torsion or by both.” Also of employing single, double, “ or treble compound purchase springs, “ by means of which “ the body of the carriage is retained more nearly at a “ permanent (distance) parallel from the road or rail irrespective of load; and of fixing such springs between the crank “ and spokes of the wheel, upon and by means of supplemental “ dwarf axles within, and radiating from the main axle “ cranks.”

Further, the invention consists in “ employing vibrating “ wheels, and also constructing the wheels with a metallic

“ nave, in such manner that they are attached to the axle  
“ cranks direct, without the intervention of an annular collar  
“ on and solid with the axle” and in the use of “tortuous or  
“ sinuous spring ends connected direct to the axles, to be  
“ substituted in lieu of and to answer for lateral springs.”  
Also in employing “inclined hydraulic or ratchet wheel  
“ vibrating pressure plates in hollows of carriages to allow  
“ the axles to recede within in lieu of collision with the body  
“ when heavily laden,” such apparatus being also applicable  
“ for obtaining motive force or pressure from its velocity or  
“ momentum, in lieu of employing brakes.”

Other parts of the invention consist in “elongating and  
“ concaving one of the buffer heads at each end and inverse  
“ sides,” and employing in connection therewith a certain  
transverse shaft, certain arms, a draw bar, with plates, a  
spring bar, and an “equiradial” bar and wedges, “for  
“ alternately lengthening one and shortening the other  
“ buffer rod at each end,” the arrangement being such that  
“ one set of rods and springs acts for both the buffer rods and  
“ draw link;” also in employing “a tubular semi-axle upon  
“ each end of a solid, central, and inner one,” with radius  
rods to connect, expand, and contract such parts; in so  
arranging the wheels of vehicles “as to be vibrating in the  
“ direction of the vehicle’s length during transit; in employ-  
“ ing transcursive” wheels, to vibrate transversely to the  
vehicle’s length; in employing “concentring or vibrating  
“ wheels and axles,” with an “equiradial wedge bar or other  
“ motion for actuating them;” in constructing wheels “with  
“ vibrating, concentring, or radiating flanges, to enable  
“ them to travel on rail and ordinary ways intermittently or  
“ indiscriminately,” in forming vehicles with some of their  
parts hung upon hinges, or pressure plates fixed in situations  
so that the vehicles or persons passing to or from them shall  
pass over such apparatus, and employing vulcanite and other  
tubes, cushions, or pillows under or between them to obtain  
auxiliary motive force; and in transmitting and applying  
such motive force to propel carriages along to move weights  
to or from carriages, waggons, and other vehicles; “for  
“ regulating the fulcrum of the springs, and other similar  
“ purposes.”

[*Printed, 2s. 6d. Drawings.*]

A.D. 1858, September 25.—No. 2153.

ROMAINE, ROBERT.—Traction engines. This invention has relation chiefly to steam cultivators, but parts of it are applicable to road or other locomotives. The engines and boiler are so arranged as to adjust the weights upon the wheels and also to secure a supply of water on the crown of the fire box when on inclines. To prevent slip of the driving wheels, a number of tines or picks are placed on an axle between the wheels. When slip is anticipated these picks are allowed, by means of proper gear, to come into contact with and dig somewhat into the ground. These picks then serve as abutments to projecting side pieces attached to the wheel rims and thus prevent the latter from slipping on the ground. To facilitate turning a turntable is placed under either or both of a given pair of wheels. Various forms of this turntable are shown. The steering gear described in the specification, No. 2568, A.D. 1857, is also improved by providing “sliding bearings for the transverse shaft that “carries the two worms” and hand wheels “and throwing it “and the two worms out of contact with the worm wheels, “relieving the steering wheels from any controlled action in “turning round; the transverse shaft when in gear is acted “upon from the platform behind by levers and bevil “gearing.”

[*Printed, 1s. 9d. Drawings.*]

A.D. 1858, October 2.—No. 2196.

SAMUELSON, BERNHARD. — Iron wheels. The invention consists, firstly, in “the construction of wheels to be used “on common roads with bent wrought iron or steel spokes “of hollow section, so placed that when the wheel is complete, “the flat or convex external part of the spoke shall be next “to the tyre; and the opposite hollow or concave part shall “be toward the nave, the hollow form giving stiffness, and “its position facility for rivetting, and space for rivets of “good size.”

Secondly, in “varying the angles of the spokes to the “centre of axle by means of regulating pieces attached to “the moulding box in which the nave is run upon the “spokes.”

Thirdly, in “the application of steel or steeled tyres to  
“ common road carriage wheels of this improved or of any  
“ other construction.”

[*Printed, 10d. Drawing and Woodcuts.*]

A.D. 1858, October 6.—No. 2221.

HILL, CHRISTOPHER.—Omnibuses, and windows for carriages.  
“ This invention has for its object improvements in omni-  
“ buses, and in apparatus for upholding the windows of  
“ omnibuses and other carriages. For these purposes,”  
says the patentee, “I apply a raised footpath or platform  
“ from end to end of an omnibus, the space below such  
“ footpath or platform being open or clear for the feet of the  
“ passengers occupying seats. The platform or footpath is  
“ supported from below by light iron brackets or stands. By  
“ these means passengers may pass freely in and out of an  
“ omnibus without the other passengers being liable to have  
“ their feet stepped on. In order that the window of an  
“ omnibus or of any other form of carriage may be applied  
“ in any desired position, a strap is fixed thereto at its lower  
“ end, as heretofore; this strap passes over a roller and  
“ under an excentric, which turns on suitable necks or axes;  
“ this excentric is grooved or roughed where it comes in  
“ contact with the upper surface of the strap, so that the  
“ weight of the window, when partly raised, will, by drawing  
“ on the excentric surface, cause it to press the strap strongly  
“ between its surface and the surface of the roller below, and  
“ thus securely uphold the window. In order to relieve the  
“ strap from the pressure from the roughed or grooved  
“ surface of the excentric roller, there is a projection or  
“ handle on such excentric roller or on its axis, by moving  
“ which the excentric surface is raised off or partially off the  
“ strap, and thus, by removing the pressure from the strap,  
“ the window is allowed to descend to any distance required.”

[*Printed, 5d. Drawing.*]

A.D. 1858, October 7.—No. 2227.

THURNHAM, CHARLES HENRY.—(*Provisional protection only.*)  
—“Improvements in the construction and application of certain  
“ mechanical arrangements, to be adapted to the wheels of

“ locomotives, carriages, and other vehicles, for facilitating their traction or draught.”

This invention consists “ of a peculiarly constructed ring, which can be slipped over the tyre of the ordinary wheels of vehicles of every description, and is retained in its situation by being channelled so that the carriage wheel can work therein, and while itself rotating will rotate the external ring, which thus becomes a kind of annular railway or tramway for the several wheels of vehicles thus provided to travel upon.”

These rings may be variously constructed and of a variety of materials, and if the groove in such a ring “ is not too deep, and the ring kept of the required diameter the external ring will be within and supported in its place from below upwards by the sides of the groove or channel, at or about the level of a central line drawn horizontally through the wheel.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, October 13.—No. 2284.

BRABY, JAMES, and BRABY, JAMES, junior.—Wheels, traction engine, brakes, springs, &c. As regards wheels, the first part of this invention consists “ in constructing the wheels in sections, composed of blocks of wood having the grain running all in the same direction, so that when the blocks are all assembled together in the form of a wheel, the grain throughout the whole will be from the centre to the circumference, or parallel to radial lines. The blocks may, if required, be made to abut against a central cast-iron box to receive the axle, or such box may be altogether dispensed with. The blocks must be collected together laterally by straps and rivets, or other suitable contrivances, so as to form one solid mass, with the end way of the grain always presented as a rubbing or wearing surface.” The patentees stating that by thus arranging the blocks not only is increased strength and resistance to wear obtained, but there is also no liability of the wheel getting out of shape from warping or unequal shrinking.

They also state that the latter advantage may be obtained “ by arranging the blocks of wood in such a manner that the line of the grain may always be parallel to a tangent or

“ cord of the circumference, with the endway of the grain of  
“ each block abutting against the endway of the grain of the  
“ contiguous blocks.”

Another part of the invention relates to wheels of a larger  
“ diameter than those made solid in the manner above  
“ described.” The patentees propose, in making such larger  
wheels, to employ metal naves, having sockets made therein  
to receive the ends of wooden spokes. The nave is formed of  
one piece of cast-iron, having therein not only sockets for the  
reception of the ends of the spokes, but also chambers or  
recesses for the reception of oil or other lubricating material  
for the axle ; the latter, after being passed through the nave,  
being secured by means of a metal washer and lynch pin in  
the usual manner, or by means of a screwed nut. At the  
outer end of the axle a flanged, hollow, hemispherical cap  
piece, or cover, is secured to the nave in any convenient  
manner, and is provided with a hole through which lubricating  
material may be supplied to the end of the axle when required.  
This hole is supplied with a plug or screw, as usual, and in  
order to prevent the leakage of the oil an elastic washer is  
placed between the flanges of the cap piece and the nave.

Another improvement in carriages consists in coating or  
covering the springs of carriages with gutta percha, india-  
rubber, or some other analogous elastic or flexible waterproof  
material, for the purpose of preventing moisture from enter-  
ing between the plates of the springs and causing them to  
oxidise.

Another part of the invention relates to means of retarding  
the progress of carriages, and consists “ in adapting to some  
“ convenient part of the axletree or framing of the carriage,  
“ near the nave of the wheel, a drop lever or bar, with a  
“ kind of shoe or solid bent up end or crank piece, which  
“ will be allowed to act on the periphery of the wheel ”  
upon the falling of such lever ; the latter being held out of  
use, when not required to act, by means of a chain and a  
hook. Apparatus of this kind may be applied so as to act  
in retarding the forward motion of vehicles, and also so as  
to prevent such vehicles from running backwards when  
“ ascending or stopping on a hill or inclined plane.”

The invention further relates to an endless railway or road  
applied to a traction engine or common road vehicle. This



portable road consists of a large wheel having a ribbed or toothed inner surface upon which a wheel of the vehicle runs. The large wheel is held in its place by guide wheels attached to the framing, and the wheels of the vehicle, when necessary, as in the case of traction engines, are driven by gearing.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1858, October 25.—No. 2374.

COTTAM, EDWARD.—(*Provisional protection only.*)—Cushions and arm rests. This “invention relates to an improved construction of seats, backs, and elbow rests of carriages, and consists in the first part in the substitution of a peculiar combination of metallic springs, lathes, and covers for the ordinary seats and backs.”

“The second part consists of an improved arm or elbow rest, so constructed as to turn up or down when desired, so that the seat may be converted into a couch. These improvements may be used either separately or conjointly. To effect the proposed objects,” the inventor says, “I construct the elastic portion of the seat or back in part or otherwise, agreeable to the specification attached to my former patent for ‘Improvements in Bedsteads,’ dated the 16th of June 1846, which is a novel arrangement of metallic springs, and their connections, by which superior elasticity and other advantages are obtained in the surface whereon the bedding is placed. This elastic foundation I cover with leather, horsehair, cane, or other suitable fabric, a sheet of woven cocoa-nut fibre, jute, or other suitable material being interposed between such covering and the elastic foundation, by which I produce an elastic seat without stuffing or padding of any kind.” “To render the arms or elbow rests moveable, I attach them to the framework of the carriage, so that they may either be turned up or down as convenience may suggest.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, October 29.—No. 2413.

KIRKAGE, WILLIAM.—Composition for various purposes. If this composition is intended to be used for cushions under springs or for cushions for heavy vehicles where no springs

are used, it is made up of sixteen pounds of india-rubber, twenty-five pounds of tar, forty-eight pounds of finely powdered chalk, sixteen pounds of hemp and ten pounds of sulphur.

[*Printed, 4d. No Drawings.*]

A.D. 1858, November 4.—No. 2461.

OXLEY, JOHN.—Improvements in carriages. The first part of this invention consists in “constructing a two-wheeled carriage, so that it may be used as a close or open carriage “at pleasure,” the patentee stating that this carriage, unlike a Hansom cab, may be made to carry three persons comfortably, or two persons with luggage, and that the door or doors may be closed by the rider or passenger from within, or by the driver or servant without dismounting for that purpose. The body of the vehicle is constructed in a somewhat similar manner to that of an ordinary box cab, but with the driver’s seat behind, there being introduced between the shackles supporting the weight of the body upon the springs, a cylinder of vulcanised india-rubber or other elastic material, which will mitigate the jarring and noise occasioned by the vehicle passing over stones. A doorway is formed on each side of the carriage in front of the wheels. These doorways being furnished with slidings doors, which when drawn forward close against pillars supporting the front of the vehicle, such front being either flat, circular, or polygonal. The front pillars should be so formed that when the doors are drawn back, they will overhang or overlay the thickness of the panel frames or sides of the carriage when the latter is used as an open vehicle. The doors may either slide outside the panels or the sides of the carriage may be double and the doors work in the spaces between them. The closing and opening of the doors by the driver from behind may be effected either by means of lines and pulleys, by levers, or by any other suitable means, passengers opening and closing them by hand. The cylinders of elastic material mentioned above may be applied in like manner to carts, trucks, and other vehicles different modes of applying “elastic shackles,” and hanging or suspending the bodies of carriages being also set forth.

Another part of the invention relates to the fore carriages and locking or wheel plates of four-wheeled vehicles, and

consists in substituting for the apparatus ordinarily used for turning four wheeled carriages a novel contrivance by means of which a vehicle may be turned within a short space more easily than usual, and may be furnished with higher front wheels. The apparatus employed consists, in the first place, of two flat iron rings or wheel plates of suitable diameter and strength, each having a bar or transom piece across its diameter, and these plates being connected by a centre pin or perch belt, this passing through the transom or bed plate and through the opposite bed piece, to which it is secured, there being combined with these plates a slide bar carrying a short bar or connecting piece to which the futchells or the splinter bars are attached, and certain forked and other bolts, loops, and other mechanism being employed in carrying out this part of the invention, the details of which are capable of modification.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1858, November 8.—No. 2500.

CAMBRIDGE, WILLIAM COLBORNE. — (*Provisional protection only.*)—Tubular iron for whipple-trees, &c.

The following is the inventor's provisional specification:—

“ This invention relates to a novel manufacture of iron bar  
“ or rod, having the property of the tube and the solid bar  
“ combined, whereby great strength with lightness is ob-  
“ tained. To this end I form a tube of any given diameter,  
“ and cause to project radially therefrom a rib or flange for  
“ the whole or any portion of the length of the tube. This  
“ flange may be pierced with bolt holes to permit of hooks or  
“ other means of attachment being secured thereto, when,  
“ for example, the tubular bar is applied to the purpose of a  
“ whipple-tree.

“ It will be obvious that this novel construction of bar or  
“ rod will be applicable to a variety of uses where the com-  
“ bination of great resisting powers and lightness are re-  
“ quired.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, November 13.—No. 2548.

TAYLOR, JAMES.—Traction engine. The engine is carried upon two driving wheels and either one or two pairs of other

wheels. When there are six wheels the leading and trailing wheel axles are coupled so as to swivel or lock in harmony and so facilitate steering. The driving wheels have a number of hollow "box-like feet." These are connected with the nave or periphery by springs which thrust them outwards in soft ground. Instead of these feet, studs worked by an excentric, or by springs may be used. The springs are placed either round the nave of the wheel, or within the peripheries or spokes. The driving power is derived from inverted cylinders, and is communicated to the axle through variable gearing. The power may also be used to work a crane barrel or winch or for other purposes. The gearing is not prejudicially affected by the action of the bearing springs. A toothed ring is attached to the wheel and is driven by a pinion the shaft of which runs in bearings on the axle box. A pitch chain communicates motion to this pinion. A short boiler, somewhat like a marine boiler, is used. One driving wheel may be caused to turn faster than the other and so facilitate steering.

[*Printed, 1s. 9d. Drawings.*]

A.D. 1858, November 16.—No. 2569.

BRENNAND, JOHN.—Auxiliary steam power for common road purposes. This invention consists "in combining the  
" power of the steam engine with that of horses or other  
" draught animals, in order that the steam power may assist  
" in the locomotion of the carriage or machine at times when  
" the resistance exceeds the animal power employed. The  
" animal power is to be so applied, that as the resistance to  
" the wheels of the carriage is increased by the nature of the  
" ground or otherwise, the efforts of the animal shall open a  
" steam valve of an auxiliary steam engine attached to the  
" carriage, and thereby impart an extra tractive power to the  
" driving wheels to enable them to overcome such temporary  
" resistance, the valve being closed by a spring or otherwise  
" when the steam or other power is not required."

The drawing shows a vehicle having an engine beneath it and a vertical boiler in front. Th shafts are put into connection with the steam valves so that the extra efforts of the animals counteract the pressure of a spring and work the

valves. The tires of the wheels are formed of segments of wood in a metallic framing.

[*Printed, 6d. Drawing.*]

A.D. 1858, November 22.—No. 2653.

SPENCER, THOMAS.—Springs. This invention relates in the first place to certain “improvements upon the springs known “as Baillie’s volute spring, and these improvements consist “in preparing the coils with ribs or projections upon them “for the purpose of strengthening the coil and also of preventing the coils pressing their whole surface upon each “other when the spring is compressed; these ribs or projections may be formed upon the coil in any position or direction.

“The improvements further relate to springs of the ordinary “construction or laminated springs, and consist in the dispensing with the slits and their accompanying studs or ribs “at present used in the construction of these springs. This “object is accomplished by forming at the ends of the plates “small hollow ribs or projections, the under side or cavity “formed in making these ribs upon the upper plates, fitting “upon the ribs or projections upon the under plates or vice versa.”

[*Printed, 9d. Drawing.*]

A.D. 1858, November 27.—No. 2701.

BURRELL, CHARLES.—Traction engines and carriages. “In “constructing the wheels which run on the portable railways, “trough or double angle iron is used in such a manner that “there are two rows of iron spokes to each wheel, the outer “ends of which are fixed to the trough iron or double angle “iron ring, and there are openings or spaces through the “trough or double angle iron for the passage between the “two rows of spokes of the A-formed bars or projections “which connect the shoes constituting the portable railway “with the wheel, the shoes being each formed with two “parallel rails on their upper surfaces on which the tyre “of the wheel runs, the A-formed bar or projection being “fixed to the shoe between such parallel rails; and the guide “irons for such projections are fixed to the trough or double “angle-iron so as to come on each side of the projections. In

“ order more advantageously to gear the main or driving  
“ shaft with the driving wheels, pinions are affixed (one at  
“ each end of the driving shaft) which when in action gear  
“ into the cog wheels on the driving wheels of the carriage,  
“ and the boiler and engines are so carried by the axle of the  
“ driving wheels, that they may be raised or lowered thereon by  
“ means of screws and levers, by which means both or either  
“ of the pinions on the main driving shaft may be put in  
“ gear with the cog wheels of the driving wheels of the car-  
“ riage, or both the pinions may be out of gear with their cog  
“ wheels according as the end of the boiler is raised or  
“ lowered in respect to the main or driving shaft.”

The steering is effected by means of a semi-circular rack and a pinion worked by a hand wheel. By means of the lifting gear the water in the boiler may always be preserved at a level.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1858, November 29.—No. 2710.

COLLIER, GEORGE, and NOBLE, WILLIAM.—Shaping spokes.

“ The improvements relate to an adaptation and combination  
“ of means to facilitate the cutting of spokes for wheels, which  
“ improvements are also adapted to the cutting of forms for  
“ other uses. For this purpose the wood to be cut is held  
“ endwise, as in a lathe, and so that rotary motion may be  
“ given to it whilst it is acted upon by two rotating and  
“ traversing cutters. One of these cutters in its rotation  
“ during its traverse simply acts to reduce the outer surface  
“ of the wood to a cylindrical character. The other cutter is  
“ also capable of a motion in a direction to or from the wood  
“ to be cut, and a projection or follower from the sliding  
“ table supporting it is constantly borne towards a model  
“ spoke or other form being copied, and which is caused to  
“ rotate simultaneously with the wood to be cut, by which the  
“ article cut will, by this second cutter, be cut to the figure  
“ of the model. In order to give steadiness to the wood being  
“ cut, especially towards the centre of its length, it passes  
“ through a fixed brace or support of a form suited to embrace  
“ the wood just after being operated by the first cutter, and  
“ before being acted upon by the second.

“ The cutters employed for cutting spokes and such like  
 “ articles are of a disc form, with cutting edges formed across  
 “ the periphery in an angular direction, and such cutting  
 “ surface of such cutter is partly cylindrical and partly  
 “ curved to a smaller diameter, so as to enable them  
 “ progressively to cut from the outer surface to the depth  
 “ desired ; and the face of the cutter in the direction of its  
 “ cutting is all round it near its cutting edge recessed or  
 “ dished, so as to admit of sharpness at those parts. The  
 “ second or finishing cutter as well as the follower, in place of  
 “ being carried by a traversing slide, may be supported by  
 “ a lever or levers capable of the required movement.”

[*Printed, 1s. 7d. Drawings.*]

A.D. 1858, December 1.—No. 2747.

BESSEMER, HENRY.—(*Provisional protection only.*)—Wheels and tires. This invention consists in casting wheels or tires in moulds arranged horizontally and to which rotation is communicated, so that the fluid metal is caused to form a ring by the action of centrifugal force. By regulating the temperature and pourings various kinds of iron can be used in the same wheel. These rings may afterwards be forged. The inventor also proposes to cast the wheel tires or rings on to the spokes and other parts, which are previously prepared and arranged in the mould for the purpose.

[*Printed, 3d. No Drawings.*]

A.D. 1858, December 21.—No. 2919.

MAINWARING, WILLIAM.—(*Provisional protection only.*)—Brakes.—The inventor thus describes his invention, which  
 “ relates to brakes for two-wheeled vehicles : ” — “ On the  
 “ axletree I attach a rigid pendent arm or arms, the lower  
 “ part of which supports the fulcrum of a long lever, the fore  
 “ end of which carries a skid or brake surface, which when  
 “ lowered rubs against the ground ; this end of the lever  
 “ projects forward in front of the wheels, while the back and  
 “ free end by which the brake is actuated projects behind the  
 “ cart or other vehicle, so that the driver may readily apply  
 “ it. This end of the lever is furnished with an arc and stop  
 “ pin, or other suitable contrivance, by which to fix the lever

“ in the different positions desired. Accordingly, another  
 “ arrangement in addition to the lever, I apply a stay or prop  
 “ from the shaft to the brake surface or skid, so that when it  
 “ is forced forward by the leverage, it at the same time tends  
 “ to raise the shafts and so relieve weight from the horse’s  
 “ back, which is also the case in some measure in the arrange-  
 “ ment first described. For dog carts, gigs, &c., I use com-  
 “ pound leverage, so as to bring the range of the hand lever  
 “ within convenient reach of the driver while on his box.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, December 24.—No. 2948.

SMITH, ALFRED.—(*Provisional protection only.*)—“ Improve-  
 “ ments in gigs, dog carts, and other vehicles.”

This invention which relates to the adjustment of the  
 draught of two wheeled vehicles “ consists of a spring resting  
 “ upon a lever affixed in or to the framework of the front part  
 “ of such vehicle, the lever being connected with a plain or  
 “ other wheel having two circumferences inserted in the nave  
 “ of one of the wheels of such vehicle, whereby the draught  
 “ will be regulated thereupon by the action of a self-acting  
 “ and self-regulating lever, moving either backwards or for-  
 “ wards according to the weight affecting the same, and by  
 “ means of motion to be thereby given to a pair of wheels  
 “ connected with a self-acting and self-regulating screw  
 “ attached to the body of any such vehicle, in consequence  
 “ whereof the draught on such vehicle resting upon three  
 “ wheels upon either side inserted in the framework of such  
 “ vehicle will be regulated and adjusted, and the body or  
 “ framework of such vehicle may be drawn by the before-  
 “ mentioned screw either backward or forward according to  
 “ the weight acting on the before-mentioned spring and  
 “ lever respectively.”

[*Printed, 3d. No Drawings.*]

A.D. 1858, December 27.—No. 2963.

LOWE, HENRY, TRUEMAN, WILLIAM, and PITTS, JOHN  
 LINWOOD.—*Axle.* The patentees say “ in making an axle  
 “ according to our invention we turn a groove in the arm of  
 “ the axle, and near the end of the said arm, the said groove



“ being turned out of the solid metal. By making the said  
“ groove as described, the end of the arm constitutes a head  
“ separated by a neck from the arm of the axle. In the said  
“ neck we slide a saddle piece, the said saddle piece entering  
“ the said groove by a vertical motion, and being guided in  
“ its motion by ribs on one face of the said saddle piece, en-  
“ gaging in guide grooves on the inner face of the head at  
“ the end of the axle. A screw passed through the end of the  
“ axle secures the said saddle piece in its place. On the arm,  
“ and between the saddle piece and the axle box, we place a  
“ ring collet or washer; the said ring collet having at its  
“ lower side a projecting piece which engages in the lower  
“ part of the saddle piece, and by which engagement the said  
“ ring collet is prevented from turning round. The end of  
“ the axle may be covered by a cap of the ordinary kind.”

[Printed, 6d. Drawing.]

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## 1859.

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A.D. 1859, January 4.—No. 36.

DE FOREST, CHARLES.—(*A communication from Charles Good-year, junior.*)—India rubber springs. The object of this invention is to obtain a large amount of elastic effect from a comparatively small mass of vulcanised india rubber; it having been found that the material is as a rule, too unyielding for direct application to light carriages. “To attain this  
“ end the vulcanized india rubber or other elastic gum is  
“ interposed between the weight to be supported and sustain-  
“ ing levers (which are themselves connected to the carriage,  
“ frame, or other bearing surface by shackles or pins), or the  
“ india-rubber may be placed between the bearing surfaces  
“ and the sustaining levers. In either case the varying  
“ pressure of the load will bring the levers to bear with  
“ more or less force on the india-rubber, and cause the india-  
“ rubber at all times to give out the required amount of  
“ elastic sustaining power.”

[Printed, 6d. Drawing.]

A.D. 1859, January 8.—No. 71.

LYTTLE, WILLIAM A.—(*Provisional protection only*).—Substitute for springs.—This invention consists in the application of a weight for the purpose of producing a counterpoise or spring action. A weighted curved lever rests in contact with another lever curved in the reverse direction. Pressure being applied to the short arm or turned end of the latter lever causes it to press against and partially lift the weighted end of the former, and the nature of the curves is such that a progressively increasing purchase is given to the weighted lever.

[*Printed, 5d. Drawing.*]

A.D. 1859, January 11.—No. 81.

BIERS, JOHN, junior.—Self-acting brake. In the case of a four wheel carriage, the fore carriage is capable of a longitudinal as well as a rotary motion. Various ways are described by which this longitudinal play may be given. The fore carriage and the brake bar are connected by means of an adjustable screw coupling to provide for variation of brake pressure or wear. When the horses are backed the longitudinal motion of the locking plate or fore carriage presses the brake on to the wheels. A spring bolt controlled by the driver is used for throwing the fore carriage into or out of operation.

When two wheeled carriages are fitted with the self-acting arrangement, the brakes are worked from the tug plates on the shafts. These plates are longitudinally moveable.

The brake block claimed by the patentee is of iron with wood pieces let into grooves in its face.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1859, January 12.—No. 91.

BRAY, WILLIAM, and BRAY, WILLIAM THOMAS GEORGE.—“Improvements in locomotive and traction engines.”

Most of these improvements have for their object to prevent stripping and destruction of driving gear, in consequence of the up and down motion of the driving axles when the latter are fitted with springs. The gear described by the patentees, moreover, combines quick and slow motions, each capable of being put to work on a toothed ring on the driving wheel.

The driving pinions are carried “by a lever, or arm, or frame, “connected directly or by a link to the main axle or its bearing, and turning on a fulcrum on the boiler or frame of the engine.” Many variations of the improvement are described and illustrated, but they are all comprised within the above description.

For the purpose of enabling the front axle to accommodate itself to the inequalities of the ground, the front part of the engine is “supported by a pin which rests on a clip embracing “the centre of a spring which is suspended from the front “axle.” This axle “passes through a box or case attached “to the under locking plate, but is free to move up and down “at either or both ends to a sufficient extent to accommodate “itself to the inequalities of the road the arrangement of “the spring giving great facility to its motion.” The invention is claimed as applicable to “engines constructed as “described in the specification of the letters patent granted “to the above William Bray dated December 31, 1856, as well as to other engines.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1859, January 13.—No. 120.

BARRANS, JOSEPH.—Traction engines. “This invention has “for its object improvements in traction and portable steam “engines. For these purposes in constructing such descriptions of engines in order to support the weight of the “boiler and the steam cylinder or cylinders, a beam or lever “is applied at the under part thereof; the hinder end of this “beam or lever moves on an axis, the bearings of which are “fixed to the boiler. The beam or lever carries a box or “apparatus for receiving a vulcanized india-rubber spring, or “a spring of other suitable material, and the smoke box end “of the boiler rests on and is supported by the spring. The “fire box end of the boiler is carried by the axle of the hinder “or driving wheels there being vulcanized india-rubber or “other suitable springs interposed between the axle and the “bearing parts of the boiler; the fire end of the lever beam “is formed into an axle, on which the fore carriage and locking motion are arranged to turn, so as to admit of the fore “axle inclining to the one side or to the other in the event of “passing over an uneven surface. The driving wheels are

“ driven by pinions, gearing into cog wheels fixed to the  
“ driving wheels, and by preference there are two sizes of  
“ pinions used, so as to give at different times different speeds  
“ of driving, and when such is the case it is preferred to have  
“ the cog wheels which are fixed to the driving wheels cogg-  
“ ed on their inner and outer surfaces, and in order to keep the  
“ axle of the driving wheels and the axes of the pinions cor-  
“ rectly distanced they are connected by suitable links or  
“ framing, and the two pinions which drive either of the cog  
“ wheels are arranged in such manner that when the slow  
“ speed is desired, the pinion on the axis which receives its  
“ motion from the engine slides on its axis out of gear with  
“ its cog wheel into gear with an intermediate wheel which is  
“ on the axis of the other pinion, and the axis of such pinion  
“ is moved into and out of position by an excentric or other-  
“ wise. In constructing the driving wheels, each wheel  
“ consists of two or more parts or rings, which are so  
“ arranged that all may press on the ground and act as one  
“ wide ring thereon, or only one or more of the parts or rings  
“ of which a wheel is composed may bear on the ground, and  
“ one or more of the rings are made plain on their peripheries,  
“ whilst another or others is made with fixed teeth or trans-  
“ verse projections to give them a more secure holding, pre-  
“ ferring that such teeth or projections shall not go from side  
“ to side of a wheel, but only partly so, and that they shall  
“ alternate. The fore wheels may also each be composed of  
“ two or more parts or rings.”

[*Printed, 10d. Drawing.*]

A.D. 1859, January 19.—No. 166.

POUPARD, WILLIAM.—Wheel skid. The patentee says, “ my  
“ invention consists in constructing a skid or shoe for the  
“ skidding of wheels in descending inclines with a tail piece  
“ projecting from the back part and top of the skid chamber.  
“ This tail piece may be carried entirely through to the front  
“ of the shoe, and I prefer to form it of wrought iron or  
“ steel while the body of the shoe may be made of cast or  
“ wrought iron. I find the best results to be obtained when  
“ the projecting tail piece is curved upwards, but I do not  
“ limit myself to so shaping it.”

[*Printed, 6d. Drawing.*]

A.D. 1859, February 3.—No. 307.

STORER, THOMAS.—Funeral carriage. This invention relates to the construction of a funeral carriage to carry “the  
“ mourners and bearers as well as the coffin containing the  
“ corpse; the mourners and bearers occupying, if thought  
“ desirable, different compartments, and the coffin occupying  
“ a third compartment. The body of the carriage is divided  
“ by a transverse division into two nearly equal parts, the  
“ entrance to the back compartment being by a door be-  
“ hind, situated like the door of an omnibus, and the entrance  
“ to the front compartment being by doors at the sides. The  
“ receptacle for the coffin is situated under the floor of the  
“ carriage, and extends nearly the whole length of the  
“ carriage. The coffin is introduced into the said receptacle  
“ at a door situated at the back of the carriage.”

[Printed, 6d. Drawing.]

A D. 1859, February 4.—No. 324.

BONNEAU, LOUIS.—(*Provisional protection only.*)—Time register. “The seat of a cab or other vehicle is supported by  
“ means of springs against fixed steps, but the springs allow  
“ the weight of a passenger to cause the seat to descend a  
“ short distance; below the seat there is a disc on which a  
“ ring of paper (on which, by preference, a graduated scale  
“ is printed) may be fixed by suitable clips, or the disc  
“ may be covered with paint, or made otherwise suitable to  
“ be marked upon; through the centre of this disc an axis  
“ passes, to which (above the surface of the ring of paper)  
“ an arm is attached; on this arm there are two branches,  
“ each of which carries a pencil or marker, the points of  
“ which are both in the same radial line from the axis, but  
“ one of them is further from the axis than the other. The  
“ axis to which the arm carrying these pencils or markers is  
“ attached, is caused to revolve by means of suitable clock  
“ work, and is by preference, arranged to make one revolu-  
“ tion every twenty-four hours. One of these pencils or  
“ markers constantly presses on the ring of paper and so  
“ marks it as it revolves, and this pencil is capable of turn-  
“ ing on a centre on its branch arm, so that the pencil or  
“ marker may oscillate radially, and a weight is attached to

“ the pencil so that when the cab or vehicle is in motion,  
“ this pencil oscillates and makes a zig-zag line on the paper,  
“ the other pencil or marker is, when the cab or other vehicle  
“ is unoccupied, held up by means of a spring a short distance  
“ from the paper, but when the seat of the cab or other  
“ vehicle is depressed by the weight of a passenger, a projection  
“ on the under side of the seat presses down this pencil, and so causes it also to mark on the paper. At the  
“ end of the day by opening a door in the seat and removing  
“ the paper, and then observing the lines made thereon by  
“ the pencils or markers, the time occupied by the cab in  
“ conveying persons from place to place may be ascertained,  
“ also the time employed in moving from place to place when  
“ unoccupied, and also the time the conveyance is standing  
“ still.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, February 11.—No. 383.

EVANS, JAMES.—Hansom cabs. The inventor says, “ this  
“ invention, although described only as relating to ‘ Hansom ’  
“ cabs is equally applicable to other forms of two-wheeled  
“ cabs or vehicles and is intended to make such cabs or  
“ vehicles much lighter and easier of traction both for the  
“ horse and for the person or persons riding in the same.  
“ The means which I employ for effecting this object are as  
“ follows:—Instead of connecting the scroll ends on the front  
“ part of the floor of the cab to the shafts by means of rigid  
“ iron stays, I connect them thereto by springs of steel or  
“ other suitable metal, the tail end of the said springs being  
“ attached to scroll loops or other connections fixed upon the  
“ under side of the shafts. The back stay connecting the  
“ floor of the cab to the heel of the shaft, instead of being  
“ rigid, is furnished with a butt hinge joint or other mechanical  
“ contrivance at or near its centre, or at any other  
“ convenient point, having only a very slight amount of movement,  
“ but still sufficient to allow of the play necessary for  
“ the full development of my invention as aforesaid.

“ By the use of my invention such cabs or vehicles will be  
“ found to be much easier of traction to the horse, and also  
“ to the rider, and a great saving will be effected in the wear

“ and tear of the horse, the tugs and the shafts, which is  
“ occasioned by the ‘swagging’ of such cabs or vehicles  
“ when connected in the ordinary rigid manner to the  
“ shafts.”

[*Printed, 6d. Drawing.*]

A.D. 1859, February 23.—No. 493.

SCOTT, URIAH.—Preventing vibration. According to the inventor’s description the improvements consist “in the  
“ application of felt, gutta percha, india rubber, or other soft  
“ material, in combination with metal, in making various  
“ parts of carriages.

“ First, the improvement consists in making carriage steps  
“ to open and shut by the action of the door. I make a  
“ frame of any material, and fix two rods from the back to  
“ the front. I then make a small frame with sockets lined  
“ with felt, leather, or other soft material, to prevent their  
“ rattling while gliding on the rods. I then fix an iron frame  
“ with a step to the moveable frame. I then fix a lever  
“ crank to the door of the carriage and the other end to the  
“ travelling frame with the sockets, and when the carriage  
“ door is opened, the step will drop out, and when shut it  
“ will go back into its place.

“ Secondly, making of iron shafts to carriages of hollow,  
“ half round, square, oval, or other suitable shape, and placing  
“ felt, gutta percha, or other soft material in the hollow  
“ formed by the half round or other shaped iron, which will  
“ prevent the edges of the metal rubbing the sides of the  
“ horse.

“ Thirdly, making of buffer springs to railway or other  
“ carriages of felt, india rubber, or other suitable material.  
“ I fill an iron buffer case with felt or other soft material  
“ about half way up, and allowing the plunger to act on the  
“ felt, it will prevent or lessen concussion. I use a tensile  
“ india rubber spring to bring the plunger out again more  
“ rapid than the felt would act alone.

“ Fourthly, in making buffer springs to prevent or lessen  
“ the recoil of the buffer head, I adopt the following plan :—  
“ I take one or more pieces of india rubber, and place them  
“ in a buffer case against the sides towards the bottom. I

“ then place a smaller case cut in two in the inside of the  
 “ buffer case, so as to press against the india-rubber. I then  
 “ make a plunger of a wedge shape with a buffer head  
 “ attached, so that when the plunger is driven in, it will  
 “ compress the india-rubber between the sides of the two  
 “ cases, the outer and the inner ones, and by the plunger  
 “ being made taper or wedge shape, it will come back again  
 “ to its position when the pressure is taken away without  
 “ much recoiling.

“ Fifthly, I make metal sockets and shackles with lugs,  
 “ also bearings of metal of any shape required, and line them  
 “ with felt or india rubber, or both combined, or other suit-  
 “ able material; these shackles or bearings can be applied to  
 “ the ends of springs, and to isolate the bodies of carriages  
 “ and framework from each other, and to isolate the break  
 “ blocks in railway breaks, and the axle box from the axle  
 “ guard, so as to isolate with elastic material metal from  
 “ metal, or metal from wood.”

[*Printed, 10d. Drawing.*]

A.D. 1859, March 1.—No. 537.

CLOAKE, THOMAS.—“ Stopping of the bodies and wheels of  
 “ railway and other carriages.”

This invention is described by the title of provisional speci-  
 fication as applicable to other than railway carriages, but the  
 specification itself does not describe or claim any adaptation  
 to common road vehicles.

The invention consists of “ a certain improved apparatus or  
 “ ‘breaks,’ whereby the breaksmen, at the same time that he  
 “ applies the breaks of the van, also applies them to the wheels  
 “ of the other carriages of the train, the break surfaces of each  
 “ carriage being so connected by levers that the motion and  
 “ force applied becomes a thrust between one wheel and the  
 “ other, so that the force applied to the one wheel is the support  
 “ or abutment of the pressure applied to the other.” The force  
 used to work the brakes is applied “ by means of an upright  
 “ screw and hand wheel, the screw nut of which rises and  
 “ falls on such screw, and so actuates the horizontal arm of  
 “ the lever, by which the power is increased and transmitted  
 “ to the connecting links and levers of the break surfaces.



“ On one of those levers a pin is mounted, which takes the  
 “ slot of an arm projecting from a horizontal rod carried  
 “ throughout the length of the carriage, and supported in  
 “ suitable bearings in which it slides lengthways; the rod  
 “ of one carriage is connected by a link piece to the rod of  
 “ the next carriage, and so on throughout the train. The  
 “ same system of breaks being applied to each carriage, these  
 “ rods each transmit the motion by the connection before  
 “ mentioned to their several break levers, and so apply the  
 “ whole of the breaks of the train.”

The invention includes an improved coupling for carriages. In this coupling the ball lever, the screws connected therewith, and the screw nuts are all arranged as usual, but the nuts are formed on links having bosses at the opposite ends, which receive and permit of the sliding of certain short rods, these being furnished with crossheads inside the links, and shoulders outside the latter, such rods being attached by suitable means to the carriages, the result of the whole arrangement being that “the coupling connects, screws, and tightens up the  
 “ carriages like ordinary couplings, but offers obstruction to  
 “ the approach of the carriages to each other to more than a  
 “ limited extent, and as permitted by the sliding of the short  
 “ rods.”

[*Printed, 6d. Drawing.*]

A.D. 1859, March 7.—No. 596.

AIMONT, PIERRE ERNEST.—“Improvements in the construction of waggons and other carriages for railways and  
 “ ordinary roads, and of apparatus connected therewith.”

This invention consists, firstly in constructing waggons, and other carriages “in such a manner that should the  
 “ wheels of the same pass over inclined or irregular ground,  
 “ or round a curve, the body of the waggon or other carriage  
 “ will, nevertheless, continue vertical.” This is effected by “suspending the body of the carriage or waggon upon  
 “ springs from transverse shafts by means of jointed suspend-  
 “ ing rods or plates, and by mounting the said transverse  
 “ shafts upon suitable wheels by means of upright jointed  
 “ arms or frames, which are jointed to the said shafts at  
 “ their upper ends, and carry the axles of the wheels at  
 “ their lower ends.” The patentee states that he prefers

these upright arms to be forked at their lower ends "so  
 " as to embrace the wheel and receive both ends of its  
 " axle, and with their inner sides free to slide up and down  
 " in grooves formed to receive them in the side of the  
 " carriage," and that he also prefers to "form the rails with  
 " an upright tongue to take into the grooves of the wheels,  
 " so as to keep the wheels always upright," provision being  
 also made for allowing the wheels to accommodate themselves  
 to curves in the road by moving laterally.

[*Printed, 7d. Drawing.*]

A.D. 1859, April 13.—No. 923.

EMERY, RICHARD.—Springs. This invention relates to an  
 improvement in suspending carriages upon springs. Each  
 spring is so to speak made up of two parts, or the parts may  
 be considered as separate springs. The thick end of each  
 part is attached to the carriage body; the other or thin end  
 is secured to the axle by means of a pin and two projecting  
 lugs. Accordingly to each wheel there are two springs or  
 two parts of one spring, according as they are regarded, the  
 thick ends of which are secured to the carriage body and  
 gradually tapering to the axle the other ends are there  
 secured. In the case of gigs and similar two-wheeled vehicles  
 the thick end of one of the springs or parts is attached to the  
 shaft.

[*Printed, 8d. Drawings.*]

A.D. 1859, April 13.—No. 931.

GILBEE, WILLIAM ARMAND.—(*A communication from M. Tenting aîné.*)—(*Provisional protection only.*)—The following is  
 the provisional specification:—

"The improvements relate to a peculiar construction of axle  
 " for railway and other carriages, having for object to render  
 " the two wheels of the same axle independent or able to turn  
 " independently of each other according to requirements.  
 " And the invention communicated to me consists in the  
 " employment in addition to the ordinary axle, of a second  
 " hollow axle, made of iron or other suitable material of  
 " sufficient strength, serving as an envelope to the former.  
 " One of the wheels is fixed on the hollow axle, and the other

“ on the ordinary axle, the hollow axle being bored internally  
“ so as to permit the ordinary axle, which is suitably turned  
“ in a lathe, to play within it freely. The hollow axle ex-  
“ tends from the external part of the wheel fixed to it to the  
“ interior of the nave of the wheel adapted to the ordinary  
“ axle; its length may, however, be modified according to  
“ requirement. The ordinary axle supports the weight of the  
“ carriage.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, April 14.—No. 939.

PARTRIDGE, EBENEZER.—“ ‘ Pipe ’ boxes for cart and wagon  
“ axles.”

The patentee says, “ my invention consists in forming conical  
“ steel bearings in the ends of conical cast-iron boxes by  
“ casting the iron on to two conical collars shaped and pre-  
“ pared to fit the axles to which the boxes are to be fitted.  
“ After the boxes are cast I harden them in water. The  
“ two collars take the entire bearing of the axle, and the  
“ space left between them and the axle when in the box forms  
“ a grease or lubricating chamber.”

[*Printed, 6d. Drawing.*]

A.D. 1859, April 18.—No. 983.

BOYDELL, JAMES.—(*Provisional protection only.*) — Endless  
railway for traction engines. The following is the inventor’s  
description :—“ The wheels are made with flanches on each  
“ side, or with grooves on their peripheries, and they are  
“ caused to run on portions of rails carried by bearing plates  
“ or surfaces which are separated from each other, but con-  
“ nected with their wheels in such manner that as the wheels  
“ revolve the bearing plates are lifted, carried round by the  
“ wheels, and deposited in succession in front of their respec-  
“ tive wheels in a similar manner to what has been described  
“ in the specifications of previous patents granted to me. In  
“ the present arrangement the apparatus for connecting the  
“ bearing plates or surfaces with a wheel is applied on both  
“ sides of a wheel, as was described in the specification of  
“ the patent granted to me on the 29th August 1846, but the  
“ form of the bearing plates or surfaces, and the apparatus

“ used to connect them to the wheels, are different from the  
“ corresponding parts shown and described in the specifica-  
“ tion of that patent, and these parts are made more similar  
“ to those described in the specification of the patent granted  
“ to me and dated the 22nd February 1854. In the present  
“ arrangement each bearing plate or surface is made with a  
“ portion of a rail thereon, and one end of such rail projects  
“ beyond the central portion of the bearing plate, but the  
“ sides of the same end of the bearing plate or surface project  
“ as far as or farther than the end of the rail, so as to receive  
“ the opposite or back end of the next bearing plate or surface  
“ between the two front projecting portions of the sides of the  
“ bearing plate which for the time is under the wheel, and  
“ such hinder end of the next bearing plate or surface is  
“ formed with two projections, which on taking the ground  
“ come on either side of the portion of rail which projects  
“ beyond the central portion of the previous bearing plate.  
“ The portion of rail which is fixed on each bearing plate  
“ or surface only comes to the point at the back end of the  
“ bearing plate or surface, where the portions which project  
“ commence or extend beyond the main surface of the bearing  
“ plate. There are in this arrangement two sets of guide  
“ plates similar to what were described in my last-mentioned  
“ specification, one set on each side of a wheel, and there are  
“ also two sets of what are called triangular bars which work  
“ through the guide plates, two sides of each of these triangles  
“ are formed with curved or cycloidal bars such as are now  
“ applied to my traction engines, and they are attached to  
“ their bearing plates or surfaces in such manner as to be  
“ capable of moving somewhat to and fro, and in the present  
“ arrangement these bars are used and connected together in  
“ pairs at their upper ends, so that in rocking to and fro both  
“ go together.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, April 26.—No. 1046.

MAIN, ROBERT.—Wheels. This invention consists, “ in the  
“ first place, in the construction of wheels in such a manner  
“ as to be adapted for running either on ordinary ground  
“ or on tramways or railways. For this purpose there is a  
“ hollow space formed in the felloe of the wheel, in which is

“ inserted a series of segmental links connected together by  
“ pins, and forming together a kind of chain all round the  
“ wheel. The inner side of this chain rests against springs  
“ fixed in the inner part of the felloe, and the outer part of  
“ the chain is thus made to project beyond the tyre, and form  
“ a projecting ring or flange on the circumference of the  
“ wheel, so as to be capable of holding and guiding the wheel  
“ on a tram or rail. A continuous ring may be used in place  
“ of the chain of segments. By this construction of the  
“ wheel also, the weight of the carriage to which it is applied  
“ will be caused to press the said ring or flange inwards  
“ against the springs, so as to admit of the wheels of the car-  
“ riage running with the required smoothness on ordinary  
“ ground. The springs are covered and protected by a face  
“ plate.”

The invention consists, in the second place, “ in the con-  
“ struction of wheels intended to run on ordinary ground,  
“ with elastic projections on their circumference. For this  
“ purpose a hollow space is formed, as before, in the felloe of  
“ the wheel, in which springs are inserted, and there are pro-  
“ jecting pieces inserted through spaces in the tyre at in-  
“ tervals in such a manner as to rest against the springs. By  
“ this construction of the wheel the projections around its  
“ circumference will be capable of yielding to the unequal  
“ pressure of the ground. In this case also the springs are  
“ covered and protected by a face plate.”

[*Printed, 7d. Drawing.*]

A.D. 1859, May 11.—No. 1188.

LYALL, JAMES BAGSTER, and CAMPIN, FREDERICK WILLIAM.—  
Improvements in omnibuses and other vehicles. The first  
part of these improvements relates to certain variations in the  
“ saloon omnibus formerly patented by ” James Bagster Lyall.  
This omnibus is fitted with improved doors mounted on in-  
clined hinges, and is made “ more convenient by adding two  
“ or more transverse seats in front of and outside the body,  
“ one formed in or close to the front end of the body, one oppo-  
“ site this, and another with its back to this, the ascent to  
“ which will be facilitated by proper step pieces outside the  
“ omnibus (or reached from the inside of the omnibus by a

“ door and steps), and these seats should be provided with an  
“ awning or covering. The wheels of this omnibus we thus  
“ construct:—We bind the felloes of the wheel together by a  
“ band of iron which we call the false tyre, then place upon  
“ that india-rubber, cork, or any other elastic substance, and  
“ covering it by a case or box of three sides, put on the outer  
“ or real tyre in segments of a circle, and fasten it with bolts  
“ passing through the elastic substance and the false tyre to  
“ the under part of the felloes, where it is tightly screwed,  
“ but allowing for a slight expansion and contraction as the  
“ wheel rolls.” The patentees also place “a strip of cork,  
“ felt, or other elastic substance between the false and real  
“ tyre, and firmly bolt or fasten it as above described, so as  
“ not to allow of any perceptible movement, but still prevent  
“ vibration and jarring to the wheel. The true or outer tyre  
“ will be so placed and screwed upon the elastic substance  
“ and false tyre as to give additional strength and support to  
“ the joints of the felloes. We attach the wheels to the axle,  
“ and the axle to the body thus:—We have spindles passing  
“ through an iron bar fixed in or to the bottom sides, contain-  
“ ing four small rollers to facilitate the easy working of the  
“ spindles, and we have a box (say  $6\frac{1}{2}$  inches wide) resting on  
“ the axle to contain the india-rubber balls or cylinders, or  
“ other elastic substances; also a plank (say 6 inches wide)  
“ fastened to the bottom, sides, and passing under the bottom  
“ of the omnibus, and resting on spiral springs, india-rubber  
“ balls, or cylinders containing air, or solid or other elastic  
“ substance, likewise a straight iron rod fixed to the axle, and  
“ braced to the fore carriage to diminish the strain of the  
“ spindles on the iron rollers; also a small iron box with  
“ rollers for the spindles to work in, with a strong spiral  
“ spring or india-rubber buffer. We shall be able, by fasten-  
“ ing these springs to the axle in an iron groove, and sliding  
“ them either backwards or forwards, to regulate in such car-  
“ riages as desirable the weight or bearing on the horse’s  
“ back, and enable the wheels to be placed further back, and  
“ so gain increased space for entering. The details above  
“ given admit of variation.”

[*Printed, 10d. Drawings.*]

A.D. 1859, May 14.—No. 1208.

LEAHY, MATTHEW.—Endless railway. “ It is proposed to fit  
 “ on the axle or axles of the vehicle, and on each side of the  
 “ bearing wheels an eccentric, upon which eccentrics revolve  
 “ freely a pair of disc wheels. The centres of the disc wheels  
 “ are maintained slightly higher than the centres of the  
 “ bearing wheels by the aid of the fixed eccentrics before  
 “ mentioned. Each pair of disc wheels carries an endless  
 “ chain of short lengths of rail, the several lengths being  
 “ connected together by metal or vulcanized india-rubber  
 “ links, or links composed of a combination of rubber and  
 “ metal or other materials of a flexible and yielding nature.  
 “ These endless chains support the bearing wheels, and serve  
 “ as endless railways for the vehicle to run upon. The object  
 “ of the eccentricity of the disc wheels is to prevent the end-  
 “ less chain of rails from coming in contact with the peri-  
 “ pheries of the bearing wheels, except at the actual bearing  
 “ point, by which means a great portion of the strain on the  
 “ joint pins of the rails, and the friction attendant upon the  
 “ working of the rails round the wheels as the whole advances,  
 “ is prevented.

“ The peripheries of the bearing wheels may be either plain,  
 “ that is, similar to an ordinary carriage wheel, or flanged,  
 “ and, if found desirable, india-rubber bands or rims, or  
 “ felloes of wood or other comparatively soft material may  
 “ be applied to the peripheries of the eccentric disc wheels, to  
 “ prevent the noise and jarring of the endless chains of rails  
 “ as they pass over them.”

[*Printed, 10d. Drawing.*]

A.D. 1859, May 18.—No. 1234.

BRENNAND, JOHN.—(*Provisional protection only.*)—“ Certain  
 “ improvements in the construction of carriages for the con-  
 “ veyance of passengers, goods, and minerals, and also in  
 “ the apparatus for propelling the same.”

This invention consists, firstly, in a mode of constructing  
 passenger carriages by forming them of sheet metal, “ and of  
 “ a circular or cylindrical form, with the axle passing through  
 “ or underneath the centre of the body, the wheels being  
 “ recessed into the sides in order to gain the full width from

“ outside to outside of the wheels for inside space.” The body is carried low, and may be so arranged as to carry a great number of passengers in a short length by arranging the seats in tiers one above another. Carriages thus constructed may be propelled by steam or drawn by horses, “ or by both powers combined.”

Secondly, in constructing waggons for carrying minerals or goods of circular or cylindrical form, and with the wheels recessed in the side, as mentioned above, with reference to passenger carriages, the body being close to the ground, by which means a greater weight can be carried than by ordinary waggons of the same length or width, a stronger wagon being obtained “ with less bulk and weight.”

Thirdly, in a mode of assisting steam carriages by “ constructing them with rods worked directly by steam cylinders, “ and striking or pushing on the ground at a suitable angle, “ or by the use of levers of wood or metal applied to the “ backs of the wheels in such a manner as that when motion “ is given to them they will lift the wheels forward.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, May 21.—No. 1256.

SAVAGE, WILLIAM PEACOCK.—(*Provisional protection only.*)—Traction engine. The engine here described is mounted upon four wheels, the leading pair having a locking motion. The propulsion is effected by means of gearing acting on the hind wheels. The boiler is mounted at the rear end upon pivots or trunnions. At the front it is supported by screws which, by means of gearing, may be worked from the foot plate so as to maintain the boiler always at a horizontal position. The steering is similarly effected from the foot plate by means of gearing, and a toothed sector attached to the fore carriage.

“ In order to economise power, the hinder wheels of traction “ engines or carriages are each provided with a series of “ shoes or surfaces, which are wider than the wheels, and of “ such length as may be desired; these shoes or surfaces are “ by arms attached to springs fixed around and projecting “ from a disc in such manner that as a shoe or surface comes “ to the ground and the wheel runs thereon, the spring to “ which such shoe or surface is attached will be bent out from



“ the natural or quiescent position, and then as the wheel  
“ moves off the shoe or surface which for the time is on the  
“ ground, the spring in connection therewith will, in regain-  
“ ing its ordinary position, aid in propelling the wheel  
“ round.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, May 23.—No. 1266.

COOKE, HARRY ARTHUR.—(*Provisional protection only.*)—  
Awning or cover for omnibuses. This invention relates to a  
method of protecting outside passengers, and consists “ in sup-  
“ porting above the roof, through the medium of a suitable  
“ pole or standard, a rectangular ribbed framework covered  
“ or provided with light water and fireproof fabric, or other  
“ suitable flexible material, so as to open and close in like  
“ manner to an umbrella, and admit of being readily used as  
“ an awning, and stowed away when not required, the said  
“ awning or covering being extended over the box seat and  
“ doorway, through the medium of bracket standards.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, May 23.—No. 1269.

BROOMAN, RICHARD ARCHIBALD. — (*A communication from  
M. Masson.*)—Axles. “ This invention consists in forming axles  
“ for common road carriages in two parts, and in fixing wheels  
“ thereto, in manner hereafter stated. For light carriages  
“ the axle for each pair of wheels is formed in two lengths,  
“ one end of each length terminates in a ball or in a collar,  
“ and the other end in a journal. There is a broad shoulder  
“ formed on each length, from the further side of which the  
“ journal springs, and against which the nave of the wheel is  
“ to abut. The two spherical or collared ends are united by  
“ and revolve in a central bearing and oil box, held and con-  
“ nected to the ordinary carriage springs by strong arms.  
“ Under or between the springs there is another bearing and  
“ oil box, in which a roller formed on the axle revolves. To  
“ fix the wheels the nave is brought against the broad  
“ shoulder, a nut is screwed on the outer end of the journal,  
“ and two more bolts are passed through the nave into the  
“ shoulder. For heavy carriages, such as wagons, each axle

“ is formed of two tapered lengths terminating as before in a  
“ sphere or collar at the small end ; but instead of the two  
“ lengths being united in a central bearing, the spherical end  
“ of one length revolves in a box under or in a line with the  
“ spring on one side, while the spherical end of the other  
“ length revolves in a box under or in a line with the spring  
“ on the opposite side ; the two lengths thus cross each  
“ other.

[*Printed, 6d. Drawing.*]

A.D. 1859, May 30.—No. 1324.

DAVIS, MARCUS.—“ Improvements in the construction of  
“ wheels, axles, and boxes for carriages.”

This invention is of similar character to former inventions for which the present patentee obtained patents. One of these, dated the 6th of May 1858, No. 1004, had reference in part to wheels for railway purposes, such wheels being composed of wood, and having a groove in the periphery, into which a band of caoutchouc might be inserted. One essential part of the present invention, however, appears to consist in using a groove of an angular or **V** form, for the reception of the caoutchouc band, such band not being “square or flat at bottom,” and not being fastened to the wheel by squeezing, hugging, or confining the material, the patentee stating that bands so shaped and so fastened to the wheel were not found to work advantageously. He states, however, that he does not confine himself to the “precise angular shape” of the caoutchouc described, as any figure may be adopted which is “similar thereto,” and not included or claimed in his former patents, “and not being square at bottom, or supported by square or flat bearings.”

The other parts of this invention relate mainly to wheels “composed chiefly of hollow iron,” the object being to render such wheels “elastic and more especially useful for fast work” than the wheels of that class usually constructed. Tubular spokes are first placed in holes in the nave, and the latter is of metal, a piece of cork or other elastic material is placed in each hole, and a piece of metal upon this, against which the inner end of the spoke bears. A bar of angle iron which has been formed into a ring is then placed on the outer ends of the spokes, and secured thereto by metal ties, pieces of elastic

material being placed between the ties and the sides of the ring, and the whole united by rivetting, the wheel being then completed by the application of a caoutchouc band in the channel formed by the angle iron. Instead of such a band being used, however, the channel may be filled with cork, a thin casing of hoop iron being placed around the cork, and a tyre then shrunk upon such hoop iron, this tyre, in shrinking, descending somewhat below the edges of the angle iron.

The axle is made of tubular iron. "A small hole is formed at bottom of each axle arm, another hole on top and about the centre, formed on top for the convenience of filling with oil, which flows into the box of each axle arm."

"The boxes are iron, made red hot, and whilst in this state two short gun metal or white metal or similar metal cylinders that fit the axle arms are driven into each box from the two ends; the cylinders meet but near enough to cause a vacancy that may be deemed sufficient to retain the necessary quantum of oil. The iron box, in cooling, shrinks on the gun or other metal used, making it like a solid metal box, and the axle forms a metallic oil bottle." The "spring bearing" is made "in two halves, which may be rolled or clipped together by spring clips passing over or through the springs in the usual way." The "hollow part" is cut or notched or roughed, so that "it may gripe on the tubular axle without a chance of becoming loose. The collars of the axle may be cast, welded, or brazed on the arms. The spring bearing may be also cast, or, if preferred, in the axle; a cork is placed in each end of the axle to keep the oil therein. The nuts that keep the wheels and boxes on the arms have thin caps of metal affixed on the ends to prevent the cork from mischief or curiosity being picked or drawn out."

[*Printed, 7d. Drawing.*]

A.D. 1859, June 7.—No. 1389.

DORMAN, WILLIAM HENRY and COWPER, CHARLES.—(*Provisional protection only.*)—Traction engine. The engine described by the inventors is hung upon springs, the front wheels locking. The driving wheels are driven by their cranked axle and an intermediate cranked shaft connected by gearing with the engine. Or the wheel axle and intermediate

shaft may be connected by gearing. Each wheel may also be separately driven. Another mode of communicating the driving power is by endless chains, and in this case a third pinion or wheel is inserted in the bight of the chain for the purpose of making the two parts between the large and small pulley as nearly parallel as possible, thereby avoiding strains on the small pinion or pulley and the engines. There may also be a combination of chains. The driving wheels which the inventors prefer to use are those described in the specification of the letter patent granted to W. Bray and dated Dec. 31, 1856, No. 3102. A modification of these wheels is described, by which elasticity is communicated to the "blades of these " wheels " when " governed by an eccentric." An ordinary but short locomotive boiler is used, but the fire box is placed between the axles.—A blower is used.

[*Printed, 3d. No Drawings.*]

A.D. 1859, June 18.—No. 1476.

RANSLEY, JAMES.—(*Provisional protection only.*)—Brake.  
 " To the body of the carriage immediately under its back  
 " end is fixed a lever, one end of which projects in a hori-  
 " zontal line, the other end in a vertical line, and as secured  
 " to it a brake block either of metal only, or metal lined with  
 " wood. It will appear evident that as the guard or con-  
 " ductor places his foot upon a brake on the end of the  
 " horizontal or bell-crank lever, his weight will force the  
 " brake block against the periphery of the hinder wheel at  
 " the back part thereof, and effectually prevent the revolution  
 " of the same."

[*Printed, 3d. No Drawings.*]

A.D. 1859, June 18.—No. 1477.

RANSLEY, JAMES.—(*Provisional protection only.*)—" An im-  
 " proved omnibus."

" This invention consists in forming the bodies of omnibuses  
 " of such a shape as to give greater accommodation to pas-  
 " sengers when inside, and also greater facility when getting  
 " in and out; also in placing the wheels in such a position  
 " as to make the draught much lighter, with a shorter lock,  
 " and in constructing the wheels considerably lighter than the

“ wheels in ordinary use. In order to accomplish these  
“ objects I build the body of the omnibus narrower in front  
“ than behind, and in the spaces so left the front wheels (which  
“ are as large as the ordinary hind ones) are placed, the seats  
“ in this part of the body being of a circular form. The doors  
“ of the omnibus are placed one on each side, and the seats in  
“ the hinder part are placed back to back. This part of the  
“ omnibus is considerably lower than the front, and the  
“ wheels pass under the seats, being small or ordinary sized  
“ front wheels, and much closer together; the consequence  
“ being that on account of the extremely light structure of  
“ the entire vehicle one horse is able to do the same work for  
“ which two are now employed. The wheels are built in the  
“ following manner:—The spokes are all to be wrought  
“ together with the nave as one piece, and in between the  
“ spokes are placed pieces of wood the shape of the spaces to  
“ receive them, the wide or outer ends forming the felloes, a  
“ semicircular piece being cut out of each to place on a nut  
“ to the end of a bolt passed through the tyre from the out-  
“ side, thus forming a solid wheel.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, June 20.—No. 1478.

DEWEY, LORING DANIEL.—(*A communication from Charles Robinson.*)—(*Provisional protection only.*)—Spring seats which are described as useful for carriage purposes. The framing of the seat is nearly filled by two plates of wood or other suitable material. The plates or flaps are hinged or connected by one edge to the frame by means of elastic bands of shined cloth or other suitable material. The inner edges of the plates nearly meet in the middle of the frame space and their ends nearly reach the frame. The elastic support for these inner edges is provided in two ways. Firstly blocks or pendants of wood may be attached to their under sides and the lower ends of these blocks be then drawn together by elastic bands secured to them. Secondly, the blocks may be dispensed with and a bent piece of sheet steel screwed to the plate near their outer edges. When the seat is unoccupied the inner edges of these plates stand a little distance above the spring, but when weight is applied, the inner edges are brought down to the steel plate which is now straight and at the same time the

bands which fasten the flaps to the frame are stretched and the entire seat sinks, the centre yielding most.

[*Printed, 3d. No Drawings.*]

A.D. 1859, June 21.—No. 1495.

FULLER, WILLIAM COLES.—India rubber shackles and springs. The improved shackle is made of india-rubber combined with cotton or other suitable fibrous compound. The surface consists of vulcanised india-rubber finished in moulds, to give neatness and elasticity. Metal sockets are inserted to receive the bolts. In some cases, such as that of the round shackle known as the “round robin,” no metal socket is required. Springs are also connected by the elastic shackles made according to this invention.

The invention also relates to a method of constructing the iron frame necessary for the support of india-rubber or spiral springs. This frame consists of a staple of round or tubular iron attached by its two legs to the carriage framing and secured by braces. The axle bearing is fixed to a horizontal bar sliding on the parallel limbs of the staple shaped frame. Between this bar and the carriage framing are placed the india-rubber discs or collars or the spiral springs.

The invention purports to relate to an improvement on that formerly patented by the inventor 6 Oct. 1852, No. 260.

[*Printed, 8d. Drawings.*]

A.D. 1859, June 22.—No. 1504.

RUSSELL, WILLIAM.—Wheels for ploughs, cultivators and carriages. The nave is formed in two parts. “One, the outer part or front of the nave, is either connected to or made in one piece with the spokes, and has a recess at its centre to receive the end of the axle. The other part or back of the nave is of a cup form, and has a hole through it at the centre for the passage of the axle, and a flange round its edge through which bolts pass to attach it to the first part or front of the nave. Within the cup the axle has fixed on it a boss or bushing of cast iron, which fits the interior of the cup. As the wheel is at work the interior of the cup bears on the cast-iron boss on the axle, and these consequently become the rubbing or wearing parts, and they are both

“ easily replaced when requisite. The part forming the front  
 “ of the nave has a small hole bored in it, by which oil may  
 “ be poured into the space within the nave. Around the axle  
 “ and boss the hole is furnished with a screw plug, by which  
 “ it is closed when the oil has been poured in; the joints  
 “ between the several parts are made tight by leather washers  
 “ to prevent the escape of the oil.”

[*Printed, 6d. Drawing.*]

A.D. 1859, June 22.—No. 1506.

APPERLY, JAMES, and CLISSOLD, WILLIAM.—Elastic tires. The inventors apply to wheels elastic surfaces in lieu of the rigid tire. “These bearing surfaces” they form either of  
 “ links rivetted together and constituting an endless chain,  
 “ which is let into the grooved periphery of the wheel; or  
 they “ use detached pieces which are held in place by being let  
 “ into a groove furnished with over lapping lips. Between these  
 “ bearing surfaces and the tyre of the wheel” they “ place a  
 “ ring of vulcanized india-rubber or an equivalent elastic bed,  
 “ which will yield as pressure is put upon it by the rolling  
 “ wheel, and will thereby allow the bearing surfaces to arrange  
 “ themselves in succession upon the ground. The invention  
 “ may be readily applied to existing carriage wheels, by  
 “ substituting a troughed tyre for the ordinary hooped tyre,  
 “ and thus ordinary carriage wheels may be converted into  
 “ silent or noiseless wheels.”

[*Printed, 6d. Drawing.*]

A.D. 1859, June 23.—No. 1515.

NEWTON, ALFRED VINCENT.—(*A communication from Charles Perratone and Messrs. J. F. Cail & Co.*)—(*Provisional protection only.*)—Springs. This invention relates to the construction of an efficient and economical substitute for the plate springs used chiefly in mounting carriage bodies on their frames. To this end curved bars of steel or other suitable resilient substance are employed. In making a spring two of these curved bars are connected together at their extremities by coupling pins to form an ellipse or double bow. To the upper bow a saddle piece is jointed to carry the load or the body of the carriage (as the case may be), while to the lower bow the axle

for the running wheels is secured by bolts. In some cases the lower bow is made of two curved bars connected together, by both being jointed to a central shackle piece to which the axle is attached.

Another mode of imparting the pressure of the load to the spring is by connecting the opposite ends of the spring together by means of rods, through the outer extremities of which the pins which couple the curved bars together pass. The inner ends of these rods are jointed to a metal block which bears the load, and a vertical guide rod attached to this block passes through the upper bow of the spring. Thus the pressure of the load is taken inside instead of outside of the ellipse. In some cases an efficient spring may be made by the use only of one curved bar.

[*Printed, 3d. No Drawings.*]

A.D. 1859, July 4.—No. 1589.

HOWELLS, HENRY CHARLES, and HOWELLS, JOSEPH CHARLES.—Passenger register. Several plans are described in this specification by which the number of passengers entering a public vehicle may be recorded. These plans are however all based on a common principle, which consists in causing the passengers to enter by means of a door or passage so contrived as to compel him to stand for a moment on a moveable platform. In one form the door is curved, working on friction rollers on a little rail, and surrounded by a shield. To this door curved windows are fitted which similarly slide within the shield. The door is controlled by the driver by means of levers. The platform in the doorway is depressed proportionably to the weight of the passenger and registers on a dial a whole or half fare accordingly. A curtain fitted with brushes, sweeps the platform or step each time the door is opened. Another form of door is shown applied to a railway carriage. This is a door with levers like a turnstile, and turning on a central pivot. It is controlled by a conductor who may adjust the fastenings or catches as he may think fit. A ratchet and pawl prevent reverse action. The window sashes are hung to the central rod and may revolve with the door, or be thrown open and fastened to the standard of the framing by any suitable contrivance.

[*Printed, 1s. 9d. Drawings.*]



A.D. 1859, July 5.—No. 1599.

WATKINS, JOHN, and PUGH, JAMES.—Lubricating wheels. This invention consists “in casting or forming a grease box  
“ or lubricating receptacle in one piece with the boss or nave  
“ of the wheel itself, where the material of which the wheel  
“ is made is suitable for so doing; or the grease box may be  
“ cast or formed separately, and then fitted or secured to the  
“ boss or nave of the wheel. The interior of this grease box  
“ communicates with the axle journal or supporting spindle  
“ by means of one or more holes or slits made in the bottom  
“ of the grease box, and a tight fitting lid of wood or other  
“ suitable material is adapted in slides, or otherwise, to the  
“ top of the box, for the purpose of preventing the escape  
“ of the lubricant during the rotation of the wheel, and for  
“ excluding as much as possible the entrance of dust or grit  
“ therein. If found desirable, springs or other simple con-  
“ trivance may be employed for preventing the accidental  
“ displacement of the lid, but, in most cases, such contrivance  
“ may be dispensed with if the lid itself is made to fit suffi-  
“ ciently tight.”

[*Printed, 6d. Drawing.*]

A.D. 1859, July 14.—No. 1670.

LONGSTAFF, RICHARD, and PULLAN, ABRAHAM.—Traction engines. Various arrangements are described in this specification, but they are all modifications of one model. The driving gear and engines are in all mounted upon frames vibrating upon pins, studs, or other attachments forming part of the main framing. These vibrating frames may also be provided with springs, or they may rest on the main axle which is also fitted with springs. The frames are also strengthened by bracing. The large running wheels have wrought iron spokes secured in iron naves which are cast upon them. The felloes are of wood, protected by an iron tire provided with projecting teeth or pins. Vulcanised india-rubber may be added between these teeth. To increase the bearing surface additional side wheels are provided. These are mounted on radial levers or eccentrics so as to be capable of being lowered to the ground when required for use. By means of lateral projections they engage and turn with the

main wheels. The boiler is mounted upon trunnions, or upon the spring carriage of the steering wheels, at one end, and upon the piston of a hydraulic cylinder at the other end. By this means the level of the boiler can be adjusted in ascending or descending hills. The fore carriage is turned to the right or left for steering purposes, by means of parallel screws acting on the locking frame, or by a screw and a pair of toothed segments on the axle, in both cases toothed gearing being employed to communicate the powers. The fore carriage may be attached to the framing by a ball and socket joint fitted with a coiled spring. To prevent jar some of the open gearing may be fitted with wooden teeth.

[Printed, 1s. 11d. Drawings.]

A.D. 1859, July 19.—No 1698.

LUIS, JOZÉ.—(*A communication from Jean Baptiste Gangand.*)  
—“A new system of eccentric socket adapted to axletrees.”

The axle, which is of a conical shape, has two bushes or ‘sockets’ placed upon it and fixed by screws. These bushes are placed near the ends of the conical axle and therefore leave a space between them which, when the axle is placed in its box, serves to hold the lubricating material. The axle is held in its box by a screw cap in the ordinary way and by a collar at the other end. The collar has a friction washer attached to it. By change of the above ‘sockets wear may be compensated for.

[Printed, 9d. Drawings.]

A.D. 1859, July 20.—No. 1706.

GRADWELL, WILLIAM JAMES, and GRADWELL, DAVID.—(*Provisional protection only.*)—Axle boxes. The inventors state that their “improvements are designed for the purpose of  
“diminishing friction between bearing surfaces, such as in  
“journals or bearings employed to support shafting, axle  
“boxes, sliding surfaces, as in planing machines, or in any  
“other situation where two surfaces come into frictional con-  
“tact. The improvements consist in a novel and peculiar  
“arrangement of antifriction bowls or rollers for the said  
“purpose, any required number of which are arranged around  
“the shafts or axle, and revolve loosely in two supporting

“ discs or framings, and are enclosed within a cylindrical  
“ box which forms a bearing for the whole, so that the shaft  
“ bears and revolves upon the bowls or rollers, and the bowls  
“ revolve around and with the shaft (by contact), and bear  
“ upon the interior surface of the cylindrical bearing or box,  
“ so that the friction between the shaft and bearing is greatly  
“ reduced by the interposition of the series of bowls which  
“ partake of the two motions round their own axes, and also  
“ round the shaft. A slight modification may be made by  
“ employing one disc or frame in the centre, and grooving  
“ the bowls in the middle of their length to allow them to fit  
“ into the said circular frame.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, July 26.—No. 1736.

MICKLES, PHILO D.—(*A communication from Danforth Johnson.*)—Springs. “ The distinguishing feature or character  
“ of this invention consists in producing a spring, which is  
“ circular in form, and generally endless or of a continuous  
“ piece, and which is composed or made up of one or more  
“ leaves arranged or laid upon each other, and to which  
“ power or pressure is applied from within to elongate it,  
“ and which has all the elasticity and quickness of vibration  
“ of the elliptic spring, with greatly increased power, united  
“ with lightness of material, cheapness of construction, and  
“ great durability. The spring is made of flat spring steel  
“ of any desired or required thickness, according to the use  
“ to which to be applied, coiled or wound upon itself in a  
“ circular form or shape, a greater or less number of times  
“ according to the power or strength required; the ends  
“ being clasped or bolted together, or upon the leaves to  
“ keep the whole in proper position, and to better render  
“ available and effectual the elasticity of all the leaves.  
“ Within such spring are placed two head blocks or supports,  
“ or pressure blocks, the length of which are about equal to  
“ the radius of the spring; they should not, however, absolutely meet each other, but should be a little distance apart,  
“ so as to allow of the reaction of the spring, when happening,  
“ beyond its natural circular position. The ends of these  
“ pressure or bearing blocks resting against the springs are  
“ curved, so as to allow of the elongation of the springs, and

“ the extent of such elongation may be varied by the form of  
 “ such curves. For general purposes the form of an isometric  
 “ ellipse, drawn by six circle arcs, is deemed most preferable.  
 “ One of these pressure or bearing blocks is to be attached to  
 “ the running gear of a carriage, or to the fixed part of any  
 “ thing to which the spring is to be applied, and the other  
 “ connects with the body of the carriage, or with the thing  
 “ which is to be acted upon by the spring.”

[*Printed, 9d. Drawings.*]

A.D. 1859, August 2.—No. 1783.

ASHWELL, JAMES CHARLES.—(*Provisional protection only.*)—  
 Antifriction wheels. “ This invention consists in the applica-  
 “ tion of antifriction or auxiliary wheels to railway and other  
 “ carriages instead of the ground wheel running loose upon  
 “ the axle as is usual, the wheel and axle may be firmly  
 “ united, the antifriction or auxilliary wheels may be affixed  
 “ to the springs of the carriage, and the whole attached to  
 “ the frame thereof, when the antifriction wheels will rest on  
 “ the fixed axle, or they may rest on the box of the ground  
 “ wheel where a loose axle is used, the result being that a  
 “ considerable increase in the leverage of the wheels is  
 “ obtained together with a great reduction of friction.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, August 3.—No. 1796.

DOWLING, EDWARD.—(*Provisional protection only.*)—Orna-  
 menting carriages, harness &c. The inventor says:—“ My  
 “ improvements in rosettes or ornaments relate to rosettes  
 “ and such like ornaments of glass or porcelain, and con-  
 “ sist in forming those articles with a recess in the back  
 “ part for the insertion of a piece of leather, cork, or other  
 “ material, which is cemented therein, and forms the means  
 “ of attachment of the rosette or ornament to the article to  
 “ which it is to be applied. For harness, I prefer leather,  
 “ whereby the rosette or ornament may be sewn to the parts  
 “ of the harness desired; but instead of sewing, staples or  
 “ other contrivances may be adapted for the insertion or  
 “ attaching of straps to secure the rosette or ornament.

“ Instead of rosettes, the ornaments may be of any forms

“ and devices suitable for the purposes intended ; and may  
“ be of glass or porcelain, plain, colored, or otherwise orna-  
“ mented in addition to the ornamental form they may  
“ possess. Parts of carriages may be ornamented by the  
“ application of these rosettes or ornaments.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, August 6.—No. 1818.

DELANNOY, ALBERT FRANÇOIS.—Axle boxes. This invention relates to the construction of axle boxes having regard especially to the lubrication of axles.

“ In applying the improvements where the wheel is to be  
“ free and the axle fixed, the wheel is provided with a box o  
“ a suitable form, which turns with it. The journal of the  
“ axle is pierced or formed with a longitudinal passage or  
“ duct, at the extremity of which is a nut or box for contain-  
“ ing the lubricating material, and which is closed or made  
“ air tight by a screw. In communication with this longitu-  
“ dinal passage or duct are two or more small passages  
“ formed vertically, and extending to the outer circumference  
“ of the journal, each having a wick therein ; the upper part  
“ of the journal is hollowed out to receive a felt or woollen  
“ band ; the band is held to the journal by means of screws,  
“ which press upon the exterior surface of a leather covering  
“ on which the felt band is sewn, the leather and band being  
“ separated from the journal by a spring. The wicks which  
“ extend or dip into the longitudinal passage or duct in  
“ the journal, pass through the double surface to the exterior  
“ of the felt band to which they are attached. The opening  
“ in the nut or receiver containing the oil being on the same  
“ level as the longitudinal passage in the journal the oil  
“ will pass into the duct or passage in the journal and thence  
“ into the small or vertical ducts up to the felt band at the  
“ circumference or bearing surface of the journal, which  
“ becomes soaked, and thus lubricates the journal. When  
“ the wheel is fixed to the axle and revolves with it, the jour-  
“ nal is surrounded with a cast iron box, which is fixed,  
“ having a sheath or casing internally. This box has a space  
“ to receive the oil, which communicates with the sheath by  
“ two vertical holes, in which space is placed a felt or woollen  
“ band partially within the sheath, and kept from coming

“ in contact with the box by springs, which serve to hold it  
 “ against the journal; the reservoir of oil is on the same  
 “ level as the opening in the sheath in which the band is  
 “ placed, which becomes soaked as before described. The  
 “ box may be made of one piece and closed air-tight from the  
 “ external side by a gland or cover, the extremity of the box  
 “ applied against the nave of the wheel being closed by a  
 “ piece of leather suitably fixed.”

[*Printed, 7d. Drawing.*]

A.D. 1859, August 11.—No. 1856.

WHITE, WILLIAM.—“ A four wheeled safety sociable carriage.”

The invention consists, “ firstly, in recessing the hind part  
 “ of the carriage, so that the wheels are brought in the same  
 “ plane as the sides, thus facilitating the ingress and egress  
 “ of passengers and lessening the danger from accidents.  
 “ Secondly, in employing moveable partitions sliding in  
 “ grooves or recesses in the back of the seat, so that when  
 “ desired one or more separate compartments or divisions  
 “ may be readily contrived, a window or curtain being added  
 “ or suspended from the roof of the carriage completes the  
 “ division.

“ Thirdly, in making the sides of the carriage moveable, so  
 “ that either windows or curtains may be used, thus making  
 “ it either an open or closed conveyance.

“ Fourthly, in making the seats to the front facing the  
 “ back of the driver, and in causing the doors to open in  
 “ opposite directions to each other for the purpose of making  
 “ one step on each side suffice for two entrances. And fifthly,  
 “ in constructing a boot under the carriage, and another at  
 “ the end with lids, doors, &c., to the same.”

[*Printed, 9d. Drawing.*]

A.D. 1859, August 17.—No. 1894.

NEWTON, ALFRED VINCENT.—(*A communication from Isaac M. Singer.*)—Construction of carriages and reining in horses: The first part of this invention relates to improvements in the arrangement of carriages for the purpose of increasing accommodation. The carriage described and illustrated

resembles externally a stage coach. Inside, in the rear half there are two rows or tiers of seats, one tier behind and above the other. The higher seats are reached by a passage through the lower row, formed by a hinged back. They face each other so that the two passengers occupying them ride sideways. The occupants of the lower seats face the horses. The seats in the front half of the body are similarly arranged except that all the occupants may ride sideways if preferred. Under the front seats is a luggage locker reached from outside. Behind the main body of the carriage, in place of the usual boot, is a coupé containing two seats with a door at the back and another into the main body by way of the passage through the seats. Under one of the coupé seats may be a water-closet, under the other a locker. There may also be fitted in the carriage a bed for a child. There are seats on the top of the coupé and roof of the carriage.

For reining in horses, the reins are passed round friction rollers held between two horizontal circular plates, and then fastened to a pulley on a central shaft fitted with a winch. By turning the winch different ways the reins may be tightened and the reverse. India-rubber links in the reins supply elasticity, and the reins pass through loops in a bar, by means of which it is said, the coachman can steer with his feet while he uses his hand for controlling the reins by the winch.

[*Printed, 11d. Drawing.*]

A.D. 1859, September 3.—No. 2011.

FRIOU, JOSEPH.—(*Provisional protection only.*)—Detaching horses. The improved apparatus “consists of two iron arms “attached by pivots or hinges to the sides of the carriage, “the extremities of which are pierced to receive a pin which “revolves upon a pivot fixed to the sides of the carriage; “the ends of the traces are pierced in a similar manner to the “arms. The attachment is made by bringing the pierced “end of the trace upon the revolving pin; and then also “bringing down upon the pin the pierced end of the arm; “the latter being kept in this position by a spring, the “detachment is effected by raising the arms by cords or “other desirable means, a spring then attached to the pin

“ throws off the trace, and the pin falls by the action of  
“ such spring, then by means of a second set of traces  
“ passing under the carriage, and attached thereto, so as to  
“ create a leverage, the power of the horse is brought to bear  
“ upon one or more breaks attached to the carriage.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, September 3.—No. 2018.

PARSONS, GEORGE.—Wheels. The invention consists in a mode of constructing wheels of a combination of wood and iron. The patentee says “I mould the wheel in a common  
“ two-part or other suitable box ; then lay the spokes, which  
“ are of malleable iron or other metal, in the mould, and run  
“ or cast a ring, which receives one end of each spoke.  
“ After allowing sufficient time for contraction, I cast the  
“ nave with projecting sockets, which receive the other end  
“ of the spokes. From socket to socket of the nave feathers  
“ or ribs are cast transversely. Flanges are cast on the outer  
“ edges of the ring, to hold wood felloes or packing of other  
“ suitable material. The band or tire is then shrunk on,  
“ and countersunk bolts fasten it through the felloes or pack-  
“ ing to the ring.”

[*Printed, 5d. Drawing.*]

A.D. 1859, September 5.—No. 2024.

BARRE, JEAN BAPTISTE HENRI HONORÉ RAYMOND, and BARRE, JEAN BAPTISTE MARIE ERNEST.—Engraving metals. A process is described for etching metals by means of a mixture of nitric acid and nitrate of copper. The design is first drawn in stone. An impression is then taken on paper and transferred to the metal plate which is then further protected by means of resinous and waxy compositions. The acid is then applied until a sufficient bite has been obtained. The design may be produced in relief or the reverse plates or ornaments prepared in this way are expressed to be suitable for, among other purposes, the ornamentation of carriages.

[*Printed, 4d. No Drawings.*]



A.D. 1859, September 7.—No. 2039.

LAWRENCE, GEORGE. — (*Provisional protection only.*)—Improved construction of carriage. This invention firstly relates to the arrangement or construction of a new form of carriage. The body is in the shape of an ordinary four wheeled cab. The front consists of two folding doors, on the outer side of each of which there is a seat. The driver occupies one of these seats, and the roof extends sufficiently forward to protect him and the occupant of the other seat. A cross bar or spring supports the front of the vehicle of the guiding wheel.

This guiding wheel “is applied in the front of the carriage  
“ in lieu of the fore wheels ordinarily employed. The wheel  
“ is provided with an axle passing through its box or centre,  
“ and fixed to a circular wheel-like frame, placed horizon-  
“ tally, having in it a space or aperture sufficient for the  
“ upper part of the guiding wheel to pass through. The  
“ circular wheel-like frame is secured within a frame which  
“ extends forwards from the axle of the hind wheels, and  
“ within which last-mentioned frame small friction rollers or  
“ other analogous contrivances are placed in such positions  
“ that their peripheries or surfaces may be acted against by  
“ the periphery of the before-mentioned wheel-like frame,  
“ and so facilitate the turning of the carriage in any desired  
“ direction. Another mode of arranging the guiding wheel  
“ is by placing it between two semi-circular plates, to which  
“ the axle of the wheel is secured; such semi-circular plates  
“ revolving within a fixed circular frame or collar. In the  
“ form of carriage which has been herein-before described, the  
“ shafts for the horse are hinged or otherwise attached to  
“ a bar connected with the before-mentioned circular wheel-  
“ like frame. The guiding wheel herein described is also  
“ applicable, with modifications, to carts, trucks, bath or  
“ invalid chairs, perambulators, and other carriages and  
“ vehicles.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, September 10.—No. 2067.

POLLOCK, JOSEPH.—(*Provisional protection only.*)—“ Beds,  
“ couches, and invalid or other carriages.”

This relates to improvements in “couches, hospital and “invalid beds, travelling and invalid carriages, ships’ bunks, “military ambulances, and other similar articles, and consists “in the adaptation to an ordinary bed or couch, or to any “suitable frame of wood or metal, of a moveable frame “formed of four unequal parts or divisions attached to each “other by hinges or other suitable means. One of these parts is “attached permanently to the bedstead or frame, and the “remaining three are capable of being elevated or depressed “to any required angle by means of metallic or other toothed “segments, which may be fixed in any position by palls or “pivots attached to the standing frame or bedstead.

“By means of the before-mentioned frames and toothed “segments the portion of the moveable frame at the head of “the standing frame may be made to form a back or rest, “which may be retained at any required elevation, and a “double incline for the knees, also at any required angle, “may be formed of the two moveable portions at the opposite “end or foot of the standing frame or of the bed or couch; “or these portions may be so elevated as to form one incline “from the foot to the centre of the moveable frames of the “bed or couch, or when fully extended horizontally the “whole will form a bed frame, upon which the ordinary “palliasse or mattress may be placed if required.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, September 10.—No. 2069.

**MALLETT, EDWARD JONES.**—Axles. This invention relates to axles so formed as to allow wheels placed thereon to rotate independently of each other, such axles being composed of two or more parts, capable of rotating one within another. The invention is described in minute detail, the process of forming an axle being somewhat complex, and such as will not be clearly understood without the aid of the drawings annexed to the specification; various modifications of the invention being, moreover, set forth. A main feature of the invention consists in causing two short solid axles to be inserted into the ends of an outer tubular axle, the short axles projecting therefrom sufficiently to receive the wheels of the carriage, and being supported in position by rings or collars at their inner ends, and short tubes, the short axles themselves being of smaller

diameter than the bore of the outer tubular axle, screw bolts passing through the outer tube, and into such rings or collars, and preventing longitudinal motion of the short axles within such tube. In place of screw bolts, other mechanical appliances may be used, and lubricating apparatus consisting of grease boxes with spring lids are to be attached."

[*Printed, 11d. Drawings.*]

A.D. 1859, September 19.—No. 2129.

WRIGHT, JAMES.—(*A communication from Rene Sauvage De Saint Marc.*)—Construction of carriages. The patentee says "the object of my invention is to form the front wheels of my carriages of an equal or greater diameter than the hind ones, and at the same time to enable the carriage to turn easily. I form the frame of my carriage in two parts or compartments, a front and a rear one; these two are applied or joined to each other by means of two curved partitions, but in such a manner that the front compartment can turn freely in a horizontal plane, and rests upon its axle in the ordinary manner, the hind one resting in like manner upon the axle of the rear wheels. A pole or perch passes underneath and is firmly fixed to the rear compartment, but not to the front one, beneath which, however, it is prolonged. The imperial, or top part of the carriage, is fixed to the rear compartment, at the same time passing over the top of the front one, but not fixed to it, so that it forms a perch on top, similar to the pole or perch underneath, which, while they will always retain the rear compartment in its place, will allow the front one to move to the right or left between them. To give greater security, I make use of two flat iron plates above and below the rear compartment, which act as guides to it, and enable it to turn within and between them. The door of the rear compartment may be behind, and that of the front one either at the side or in the front of it."

[*Printed, 6d. Drawing.*]

A.D. 1859, September 21.—No. 2148.

JOWETT, HENRY ALFRED.—Brakes for railway and other purposes. An eccentric keyed on the axle of one of the

carriages by the running of the carriage works an air pump, and so compresses air into a receiver, where it is available either alone or in combination with water, for pressing the brakes to the wheels, or for sounding a whistle or other signal. A counter weight is used to take off the brake.

[*Printed, 7d. Drawing.*]

A.D. 1859, September 30.—No. 2216.

SMITH, JOB ORTON.—(*Provisional protection only.*)—Perambulators. According to the inventor the improvement “consists  
“in arranging the body of the perambulator so that the  
“upper part of the back (from its junction with the seat)  
“and the board, which is usually placed (and which I in  
“all cases place) at right angles with the seat, and between  
“the front part thereof and the bottom of the body (and  
“which board I call the ‘leg-board’) shall respectively work  
“on hinges connecting the same respectively with the hinder  
“and fore parts of the seat, the back and leg-board being themselves connected together by rods or by some other simple  
“contrivance (working underneath the seat), so that the back  
“may be drawn down and the leg-board rise up simultaneously.  
“In this manner a resting place may be formed for the  
“occupant, if desired, the said back and leg-board being  
“capable of being adjusted at any desired inclination, and  
“for this purpose any contrivance may be used which may  
“seem most simple and effectual. And with perambulators  
“which carry two occupants (usually called ‘double perambulators’) I divide the back and the leg-board respectively  
“into two portions, so as to work separately, in order that  
“one occupant may be reclining and the other sitting (if  
“desired) at the same time.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, October 5.—No. 2266.

WEBSTER, JAMES.—Springs. The spring here described is stated to have “great strength and elasticity without  
“friction.” To construct such a spring the inventor takes  
“a number of steel rods tapered from near the middle to the  
“ends, and binds and welds the ends together, and when a  
“broad bearing is required a T-piece is shut on both ends

“ of the bundle ; being thus prepared the whole is heated  
“ regular, twisted spirally, and bent over a convex block of  
“ the desired form ; its ends are then dressed and it is  
“ hardened and tempered.”

[*Printed, 6d. Drawing.*]

A.D. 1859, October 11.—No. 2308.

TENTING, JOSEPH LOUIS, ainé.—Axles. The invention consists “ in the employment in addition to the ordinary axle,  
“ of a second hollow axle made of iron or other suitable  
“ material of sufficient strength serving as an envelope to the  
“ former. One of the wheels is fixed on the hollow axle, and  
“ the other on the ordinary axle, the hollow axle being bored  
“ internally so as to permit the ordinary axle, which is  
“ suitably turned in a lathe, to play within it freely. The  
“ hollow axle extends from the external part of the nave of  
“ the wheel fixed to it to the interior of the nave of the wheel  
“ adapted to the ordinary axle ; its length may, however, be  
“ modified according to requirement. The ordinary axle  
“ supports the weight of the carriage.”

[*Printed, 6d. Drawing.*]

A.D. 1859, October 11.—No. 2309.

EARL, JOHN.—Attaching horses to carriages. The tugs of the harness are fitted with metal perforated tongues or loops, which when the horse is “ put to,” drop into sockets fixed to the shafts and are there held by means of bolts. These bolts are always kept closed by means of springs. They have milled heads or buttons by means of which they are withdrawn by hand to admit the tug loops.

[*Printed, 9d. Drawings.*]

A.D. 1859, October 15.—No. 2349.

NEWTON, WILLIAM EDWARD.—(*A communication from Edward Crane.*)—(*Provisional protection only.*)—Elastic wheels.  
“ This invention relates to the application of a band or ring  
“ of india-rubber or gutta percha between the tire or outer  
“ rim and the hub or nave of a wheel made otherwise wholly  
“ or partly of iron, for the purpose of giving it elasticity.  
“ The hub and inner rim of the wheel are united by arms, or

“ by a plate or plates, and these parts may consist of a single  
“ casting, or be constructed of two or more pieces, and  
“ suitably secured together. The tire or outer rim is made  
“ separate, and the outer circumference of the inner rim is  
“ made sufficiently smaller than the inner circumference of  
“ the tire to receive between them the india-rubber or other  
“ elastic substance, and the outer peripheral surface of the  
“ inner rim and inner surface of the tire or outer rim are  
“ grooved circumferentially or diagonally in opposite direc-  
“ tions in the inner rim, or otherwise grooved, indented, or  
“ roughened. Before placing the tire or outer rim outside of  
“ the inner rim or body of the wheel, the outer peripheral  
“ surface of the latter and inner peripheral surface of the  
“ former are spread over with the plastic india-rubber to  
“ fill the grooves or depressions in their surfaces; and after  
“ the tire or outer rim has been put on and suitably adjusted  
“ and supported relatively to the inner rim or body, the space  
“ between them is filled and closely caulked with the india-  
“ rubber or other elastic substance, after which, plates are  
“ temporarily applied to the sides of the wheel to confine the  
“ india-rubber, and the whole is put into the oven or heater  
“ to complete the vulcanisation of the india-rubber. When  
“ this has been done, the side plates are removed, and the  
“ india-rubber locks the tire on the wheel as securely as if  
“ it had been shrunk on by heating and cooling.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, October 17.—No. 2365.

REYNOLDS, GEORGE WAIDE, and DANCE, ENOCH.—(*Provisional protection only.*)—Wicker carriage bodies. This invention relates to the construction of “cane or rattan” wickerwork bodies for carriages and perambulators. The inventors say, “in making articles of the said fabric or  
“ material we employ machinery resembling a loom in most  
“ essential respects, but having the additions or modifications  
“ herein-after explained. The said machinery constitutes the  
“ second part of our invention. To the breast of the loom  
“ we attach two guides, the said guides nearly resembling  
“ the letter **V** inverted. These fit upon one another, and  
“ when it is wished to produce an angle in the work being  
“ made, the fabric, which during its manufacture is passed

“ between the guides, is compressed by the said guides being  
“ brought and fixed very near to one another. One half the  
“ weft is put in the fabric before it enters the guides, and  
“ the other half is put in during the time it is being com-  
“ pressed between the guides. In order to prevent the  
“ fabric from being loosely woven, we press the warp laterally  
“ by means of a right and a left handed screw worked by a  
“ winch.”

[*Printed, 3d. No Drawings.*]

A.D. 1859, October 19.—No. 2392.

SETON, CHARLES. — Improvements in carriages. The invention consists firstly, in the construction of an endless road for wheels. “ It is proposed to turn a recess at one or both  
“ sides of the felloe of the wheel to receive the flange or turned  
“ up edge of a flat piece of metal, said flange being kept in  
“ the aforesaid recess by a ring of metal affixed to the felloe  
“ of the wheel, either at one or both sides of said wheel, as  
“ may be desired. The aforesaid flat piece of metal is hinged  
“ to other similar flat shaped pieces into the form of an  
“ endless belt, which should encircle closely the felloe of the  
“ wheel to which it is applied, the before-mentioned flat ring  
“ keeping said belt in proper position on the felloe side-  
“ ways.”

India-rubber may be applied to prevent concussion.  
“ Another part of this invention consists in connecting to-  
“ gether the axles on which the wheels are placed, by which  
“ the fore wheels of four-wheel vehicles instead of being  
“ smaller than the hindermost wheels, as is at present the  
“ case, all the wheels may be of the same size, the peculiar  
“ feature of novelty of this part of my invention consisting  
“ in causing the hindermost wheels to move sideways with  
“ the fore wheels in the act of turning the corners of streets,  
“ roads, or ways, instead of the fore wheels only turning, as  
“ heretofore practise. The means by which it is proposed to  
“ effect this part of my said invention is by employing two  
“ rods crossing each other diagonally, the ends thereof  
“ being respectively affixed to each of the axles, so that they  
“ shall operate as tension rods to pull the hindermost axle in  
“ an opposite direction to the foremost axle, thus compelling  
“ all the wheels to move in an arc of a circle, thereby facili-

“tating the draught of the vehicle to which they are applied,  
“and considerably lessening the wear and tear of the wheels  
“thereof.”

[*Printed, 9d. Drawing.*]

A.D. 1859, November 4.—No. 2507.

JUZET, ETIENNE.—Axlebox. This invention “relates to an  
“oil box or lubricator for lubricating the axles of railway and  
“other carriages. In this axlebox the journal or bearing of  
“the axle is completely enclosed, so that no dust or foreign  
“matters can enter; one-half of the surface is continually in  
“the oil.” At the inner end of the journal of the axle is a  
groove, in which is placed a ring of india-rubber or gutta  
percha, or of leather surrounded by india-rubber, or of wood,  
or metal, combined with elastic packing; or the groove may  
be dispensed with and the ring placed upon the circumference  
of the axle itself, a suitable channel being arranged for the  
introduction of oil, and there being between the channel and  
the reservoir of oil a space enclosing air, which, by its pres-  
sure, “forces the oil to remain at the same elevation, that is  
“to say, half covering the journal.” The channel is provided  
with a cover which is faced with leather, and is kept closed  
by a spring. The axlebox is, as whole so arranged that “the  
“suspension springs of the vehicle are fitted into instead of  
“being held by a strap to the upper part of the box.”

[*Printed, 8d. Drawings.*]

A.D. 1859, November 5.—No. 2522.

PICHLER, FRANCIS, and WIGLEY, HENRY JOHN. — (*Pro-  
visional protection only.*)—Propelling carriages. The propulsion  
of the vehicle here described is effected by the two and fro  
motion of the occupant of a seat placed upon it. This seat  
is on rockers or is pivotted. The rocking movement created  
in it by the occupant is communicated to the wheels by rods  
and cranks. A device for enabling the dead point of each  
crank to be avoided is described. It consists in giving the  
pin on the wheel, the crank pin in fact, a small amount of  
play in curved slot provided with a spring. The vehicle is  
steered by hand or by the feet.

[*Printed, 3d. No Drawings.*]



A.D. 1859, November 19.—No. 2614.

WILLCOCK, JOSEPH.—(*A communication from Joseph G. E. Larned.*)—Steam fire engines. Parts of these improvements are applicable not only to steam fire engines but to road locomotives generally. The driving motion is not communicated directly to the wheel axles but to an intermediate shaft, which shaft may drive the pumps or propel the engine according as it may be geared. The radius rods which control the distance between the intermediate shaft and driving axle are fitted with universal joints to allow of play in all directions. The body of the engine is mounted on springs. These are of uniform thickness but in plan tapering to the extremities. The main springs are attached to the frame by their forward ends, receive the weight at about their centres and are attached to the driving wheel axles at the other end. The steering wheels are mounted on an axle passing through the end of a vertical rod and are placed in advance of the vehicle. The springs, which are similar in shape to the main springs, are attached at the centre of the axle, one above the other on the vertical shaft. One wheel or both may be loose on the axle as preferred. The vertical rod performs the duty of steering the wheels, being actuated by a horizontal bar worked by a hand winch. The connections are in the nature of universal joints, so that the wheel axle is capable of adjustment to the inequalities of the ground.

[Printed, 1s. 5d. Drawings.]

A.D. 1859, November 21.—No. 2630.

JOCHEM, PIERRE. — (*Provisional protection only.*) — Brakes. " These improvements relate to brakes for railway or other carriages. For carriages intended to travel on ordinary roads the brakes are constructed in such manner that either by means of a spring or springs, by pulling on strings, by a winch handle and gearing or by other similar means under control of the driver, a bolt may be pushed into a kind of hook fixed against the inner surface of the nave of one or more of the carriage wheels, thereby preventing them from turning, and thus retarding or stopping altogether the motion of the carriage."

[Printed, 3d. No Drawings.]

A.D. 1859, November 26.—No. 2679.

AUERBACH, MORITZ. — (*A communication from Eduard Schroder and Julius Amuel.*)—Passenger and distance indicator. This invention relates to a modification in the apparatus described in the specification of letters patent granted to the same inventors, bearing of even date with the present letters and numbered 2681, for the purpose of adapting the contrivance to the indication of separate fares for a number or independent passengers in a given vehicle. “The apparatus  
“ is provided with a number of fare dials, all of which are  
“ numbered and correspond with the seats of the vehicle,  
“ which are numbered also. Each seat is connected to its  
“ own particular dial, and is fixed on a hinge at front, and  
“ provided with a spring, which keeps it in a vertical position  
“ or nearly so as long as it is unoccupied. The weight of the  
“ passenger occupying the seat brings it into an horizontal  
“ position, and keeps the corresponding dial in gear with the  
“ revolving train of toothed gearing, so long as the seat is  
“ occupied, but as soon as the passenger rises the seat rises  
“ also, and throws the dial out of gear, which is then returned  
“ to ‘zero’ by a spring. Each dial thus indicates to the  
“ occupant of its corresponding seat the distance he has  
“ travelled, and the fare which he has to pay. It is proposed,  
“ for the sake of simplicity and uniformity, that a regular  
“ tariff of so much per half mile or mile should be adapted  
“ but it will be readily understood that by a suitable arrange-  
“ ment of the toothed gearing the apparatus may also be  
“ adapted to indicate any other regular or irregular scale of  
“ charges. The apparatus is also provided with another dial  
“ for information of the proprietor, which adds together all  
“ the fares received, and indicates the sum thereof, at the end  
“ of the journey or of the day’s work.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1859, November 26.—No. 2681.

AUERBACH, MORITZ. — (*A communication from Eduard Schroder and Julius Amuel.*)—Passenger and distance indicator. “This invention relates to an apparatus to be applied to  
“ cabs, hackney carriages, and such other vehicles as are

“ hired to drive from place to place, at the option of the  
“ passenger or passengers, and are paid at a fixed rate of so  
“ much per mile. The apparatus is provided with two dials,  
“ one of which is always at ‘zero’ when the cab or vehicle  
“ is empty, whether the same be moving or stationary, but  
“ on one or more persons getting into the vehicle the apparatus  
“ connected with this dial is thrown into gear, and at the end  
“ of the journey or drive will indicate in figures, or letters,  
“ or both, the exact fare to be paid, according to the distance  
“ travelled and the number of persons carried, returning to  
“ ‘zero’ as soon as the passengers all alight; the other dial  
“ is for the proprietor, and only indicates ‘zero’ at the com-  
“ mencement of the day’s work. It adds all the fares indicated  
“ by the other dial together, and at the end of the day’s work  
“ indicates the sum of all the fares received. The apparatus  
“ consists principally of a suitable arrangement of toothed  
“ gearing actuated by an endless chain passing round a  
“ grooved pulley, and driven by the nave of one of the wheels  
“ for indicating the distance travelled. This apparatus is  
“ thrown into gear by a person occupying a seat in the vehicle  
“ (being connected to the seat), and continues in action so  
“ long as the seat is occupied. It may also be connected to  
“ the floor of the vehicle, so as not to remain inactive, should  
“ the passenger or passengers choose to stand. The seats of  
“ the vehicles are constructed so as to turn on a hinge at the  
“ front, and are (when unoccupied) raised out of the hori-  
“ zontal position by a spring, and when in this position hold  
“ the counting apparatus out of gear; but upon a passenger  
“ occupying a seat, the weight of the passenger brings the  
“ seat into the horizontal position, and thus puts the appa-  
“ ratus in action. The floor of the vehicle may also be made  
“ capable of slight motion in a vertical direction for the same  
“ purpose. The precise construction of the counting appa-  
“ ratus will of course depend on the tariff of fares which may  
“ be adopted, and it may easily be so arranged as to indicate  
“ the number of seats occupied as well as the distance tra-  
“ velled, and add the amount of extra fare (if any) on to the  
“ ordinary fare for the distance.”

[*Printed, 10d. Drawings.*]

A.D. 1859, November 28.—No. 2693.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Parfait Giot.*)—Poultry waggon. “The wagon consists of a  
“long carriage closed at top, bottom and sides with louvres  
“fixed in the sides to afford light and ventilation; boxes for  
“nests are arranged along the sides, and feeding troughs  
over them. Standards placed at an angle hold perches the  
“whole length of the wagon at each side, and a frame holding  
“perches on each side is suspended from the top; a box with  
“a hinged side is placed under the floor of the wagon into  
“which the excrement is swept and collected; this material  
“possesses high fertilizing properties, and has been hitherto  
“lost. The fore part of the wagon may be partitioned off to  
“form a box for the tender of the poultry, which can be  
“entered from the front or by a door at the side of the wagon;  
“a partition placed along the centre of the wagon enables  
“the tender to gain access to both sides of the wagon; the  
“wagon may serve as a fixed or as a travelling poultry  
“house.”

[*Printed, 6d. Drawing.*]

A.D. 1859, December 12.—No. 2813.

EMERY, RICHARD.—Springs. This invention consists in an improvement upon that described in the specification of the inventor's former patent dated 13th April 1859. The improvement relates to the mode of attaching the springs before described. Instead of bolting the spring to the back of the carriage the patentee fits a hanging strap from the eye of which the upper end of the spring depends. The other end is attached to the axle in the way previously described. By this arrangement a more easy action is obtained. The axle end of the forward spring is fastened with a pin square or elongated in section “to make the fastening more certain and  
“not liable to motion in the line of draught.”

[*Printed, 7d. Drawings.*]

A.D. 1859, December 12.—No. 2817.

STIRLING, PATRICK.—Traction engines. The engine described comprises “a rectangular frame mounted upon a single

“ central driving wheel, a pair of leading wheels, and a pair of trailing wheels. A boiler, by preference of the vertical class, and a pair of horizontal steam cylinders are mounted upon the frame, together with a tank or receptacle for water and fuel. A single cylinder may be used if preferred, it, or the two, being arranged to drive a first motion shaft, having fast on it a pinion in gear with a spur wheel on the side of the driving wheel, or fast on the shaft thereof. All the wheels are mounted with springs, by means of which the weight of the machine may be made to bear more or less exclusively upon the driving wheel. It is proposed to make the driving wheel with a wooden treading surface, formed by enclosing wooden blocks between metal checks in such a way as to present the fibres radially. The bite of the treading surface may be increased, if necessary, by inserting spikes, points, or ribs, or an ordinary iron hoop may be used in certain cases where great adhesion is not required. The leading and trailing wheels are mounted loose on axles arranged to swivel, being made to do so in concert in opposite directions, whereby a double effect is obtained, and the machine is made to move in a curve of much less radius than is obtainable with ordinary contrivances for the same purpose.”

[*Printed, 10d. Drawing.*]

A.D. 1859, December 17.—No. 2874.

PLUM, THOMAS WILLIAM.—Tires. This invention comprises the following improvements:—First “preparing a scarf or cut of an irregular or zig-zag figure upon the ends of bars for the purpose of welding when the bar is bent and the ends brought together and welded to form tyres for wheels, and hoops, and rings.

“Second, the employment in the manufacture of such tyres, hoops, and rings of tyre bending and blocking machines in which the rollers are strengthened and driven at a quick speed suitable for finishing the weld.”

[*Printed, 5d. Drawing.*]

A.D. 1859, December 19.—No. 2882.

WILSON, EDWARD BROWN, and NORTH, ROBERT SAM.—Cranked axles and tires. The patentees describe their inven-

tion thus:—"The method we propose to adopt in making  
" cranked axles is to forge for each a straight bar, round in  
" certain parts and flattened or squared at others, and after-  
" wards to press the said flattened or squared parts into the  
" form of a crank by a machine composed of three hydraulic  
" cylinders and rams, one ram forcing the flat part of the bar  
" between two moveable checks, which are acted upon or  
" resisted against by two other rams, thereby forming the  
" crank with the fibres of the iron running one way through-  
" out. We propose to make each tyre out of a bloom which  
" is formed in a hoop, and then roll it to the proper size and  
" thickness by a machine having three shafts, with thimbles  
" or ferrules to suit the tyre; one shaft is fixed, and the other  
" two are moveable, two shafts being used when rolling, and  
" the third when it is required to form the tyre to a true  
" circle."

[*Printed, 9d. Drawing.*]

A.D. 1859, December 20.—No. 2903.

WELCH, ALFRED.—(*A communication from James Welch.*)—  
Portable railway. This invention relates to improvements  
upon a former invention for which letters patent, dated Sept.  
1857, No. 2504, were granted to the above James Welch.  
" Instead of uniting the links to each other by means of a  
" hinge joint, as described in the former patent, they are  
" merely connected or strung together by means of an endless  
" chain or flexible metal band, or other suitable contrivance,  
" to which each link of the railway is fastened at the middle  
" on its upper side, as it lies in position for the passage of  
" the wheel over it. The general form of the links of the  
" railway as described in the previous patent is preserved, but  
" in order to retain them in their proper position instead of  
" the hinge joint, one end of each link is shaped into a tenon  
" so made as to pass freely into and out of a corresponding  
" mortice or socket formed in the adjoining end of the next  
" link, and so on in succession, thereby admitting of their  
" readily accommodating themselves to the constantly varying  
" position of the different portions of the railway in its pro-  
" gress round the carriage wheels."

[*Printed, 3d. No Drawings.*]

A.D. 1859, December 20.—No. 2907.

GARDINER, PERRY G.—Springs. According to this invention it is proposed to combine “two elliptic spring blades with  
“an elastic or extensible tension bar, the ends of the elliptic  
“springs being confined in the heads or caps at the ex-  
“tremities of the intermediate tension bar. The heads or  
“caps may either be formed in one piece with the tension  
“bar, or fitted thereto by screws and nuts, and are grooved  
“or slotted to receive the ends of the elliptic springs, or  
“the caps may be fitted by means of screws and nuts to the  
“ends of the tension bar, or the ends of the tension bar  
“may be turned over, so as to form eyes into which the  
“correspondingly turned ends of the elliptic springs are  
“fitted, a ball or rivet being passed through for the purpose  
“of keeping them in their place. The tension bars may be  
“of an undulating form in the middle part, or they may  
“consist of a pair of elongated steel blades placed together  
“with their curves outwards, but joining or meeting at the  
“ends where screw threads are cut fitted with nuts for holding  
“the caps.”

[*Printed, 6d. Drawing.*]

A.D. 1859, December 22.—No. 2921.

FLEET, BENJAMIN, RAWLINGS, JOSEPH, and CLOAKE, THOMAS.—“Improvements in the machinery for stopping the  
“bodies and wheels of railway and other carriages, and which  
“machinery is an improvement on the machinery already  
“patented by letters patent granted to Thomas Cloake, dated  
“1st March 1859.” According to this invention each carriage  
“of a railway train is furnished with a longitudinal shaft, the  
shaft of one carriage being coupled to that of another “in  
“such manner that a partial revolution imparted to one shaft  
“is transmitted to the next, and so on throughout the train.  
“The partial revolution given to the moving shaft actuates  
“an arm fixed thereon, such arm being connected with an  
“arm on a transverse shaft mounted midway between the  
“wheels on which, at each side of the carriage, is a fixed  
“double-armed lever or beam, the one arm of which is con-  
“nected with the break surface of the wheel in advance, and  
“the other with the break surface of the wheel behind. The

“ connection of the one arm is at the upper part, and of the  
“ other at the lower, the fulcrum being intermediate of those  
“ positions.” The break surfaces are mounted on pivots,  
“ the one at the upper part, the other at the lower, while the  
“ lever connections are at the opposite and free ends of the  
“ break surfaces.” The longitudinal shafts of the different  
carriages are connected by means of “triple-jointed pieces,”  
which act as universal joints, and the shafts are furnished with  
parts which permit of their elongation or contraction as may  
be required, such parts consisting either of a socket at the  
end of one shaft, into which the end of the next shaft passes,  
or of the discs fixed on the ends of the shafts with rods passing  
through holes therein, the rods having nuts thereon outside  
the discs. “The first motion is given to the shafts fitted to  
“ the brake van by the guard or other attendant of the train  
“ by means of a screw acting on a nut carried by a lever fixed  
“ on the break van shaft, which shaft acts on the breaks of  
“ its own carriage, and, being also connected with the shafts  
“ of the other carriages, as described, actuates the whole  
“ breaks of the train. The carriages are to be further coupled  
“ by ordinary couplings.”

[*Printed, 10d. Drawing.*]

A.D. 1859, December 23.—No. 2932.

GILES, JOHN.—Traction engines. These improvements are  
claimed “to consist in the embodiment of the principles of  
“ animal tractive efficiency in a locomotive engine.” The  
axle of the driving wheel is carried in bearings at the end of a  
radius bar pivotted to the side of the engine. The pivot  
sometimes forms the centre of a pinion which drives a pitch  
chain passing round a toothed rim on the driving wheel. A  
spring is placed between the axle end of the radius bar and  
the engine. A brake wheel is placed on the pinion shaft  
against which pressure is applied when it is desired to check  
the speed of the engine.

[*Printed, 7d. Drawing.*]

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1860.

A.D. 1860, January 9.—No. 59.

MATHERS, ROBERT.—Wheels and axles. “ In constructing the rim of a wheel a combination of wood and iron is used, the iron, by preference, being of a trough-like section, the wood, whether bent or cut to the desired curve or sweep, or whether used with its grain at right angles to the tire or not, is compressed, and is attached temporarily, when requisite, to the wrought or cast-iron rim; the wood is then turned down to fit the tire, which is put on cold, or nearly so, thus avoiding the bad effect of charring the wood, the subsequent swelling or expanding of the wood being sufficient to ensure the tight holding of the tire. The spokes are made of steel and their outer ends are each formed into a spiral which is tempered, and thus acts as a spring, and by such means the requisite elasticity is obtained near the outer ends of the spokes. The nave or stock of a wheel is cast on to the spokes after they have been secured properly into the rim, and it is preferred that the nave should be cast of such form as to obtain the greatest strength with the least weight, and by a one part box or flask, for which purpose the nave is cast with the enlargements for spokes alternately near the inner and outward ends of the naves, such enlargements being connected by zig-zag ridges on the surface of the body of the nave. The wheels are secured on the axles by taper screws screwing into the ends of the axles. The axles have cuts at their ends by which, when the taper screws are screwed up, the ends of the axles are allowed to expand, and the collars are made accordingly, so that when the ends of the axles are expanded they will be securely retained. The outer cap or oil cover of a wheel is secured by means of two or more lugs or projections inside the cap or cover, and corresponding grooves cast or cut in the nave in a line with the axle, in such manner that by turning the cap or cover it becomes locked, and is kept in position by an india-rubber or other elastic ring or washer fitted into the recess in the cap or cover, and against the end of the nave. The elastic washer or ring is compressed

“ by the use of a suitable screw which can be attached to the  
 “ spokes, and whilst so compressed the cap is turned round  
 “ until the projections on the cap enter the recesses in the  
 “ nave, when the elastic washer or ring will retain the cap or  
 “ cover from moving.”

[*Printed, 9d. Drawing.*]

A.D. 1860, January 13.—No. 95.

HAYES, JOSEPH.—Brake. “ This improved brake consists  
 “ of two levers, on which are fixed the break blocks, which  
 “ are pressed against the wheels by the levers acting in a  
 “ loose box formed in a traversing nut, pressure being applied  
 “ by a screw or lever. The break may be worked from the  
 “ front, back, or side of the vehicle or machine, and may be  
 “ made to act upon the boss or rim of the wheels. The screw  
 “ works perpendicularly or horizontally as the case may  
 “ require.”

[*Printed, 9d. Drawing.*]

A.D. 1860, January 21.—No. 163.

DAVID, LÉON EMILE, and VERCHER, JEAN AMÉDÉE.—(*Provisional protection only.*)—Brake. “ This improved brake  
 “ consists of two iron straps, each of which passes round an  
 “ inner collar on the naves of the wheels. These straps are  
 “ actuated by an arrangement of jointed levers, which cause  
 “ the straps to bear with friction on the collars of the naves  
 “ at the moment when the brake is used. The jointed levers  
 “ are actuated by a rod at the disposition of the conductor or  
 “ attendant.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, January 23.—No. 164.

FERRY, FRANÇOIS JOSEPH.—(*Provisional protection only.*)—  
 Relieving horses. The inventor says, “ I propose to make the  
 “ splinter bar of more than one piece, and fix the traces  
 “ thereto by means of a metal loop through which will pass  
 “ a screw firmly securing the trace in the bar. Under the  
 “ splinter bar and partly on or over the pole will be an iron  
 “ plate on which a lever will be constructed to act on the  
 “ splinter bar and shoe break ; from the end of this lever a

“ strap passes up and is attached handy to the coachman (or  
“ a rod may impinge on the end of the lever by pressure of  
“ the foot). The whole being in position the horses may be  
“ detached by merely pulling up (or pressing down) the end  
“ of the lever which causes the upper part of the splinter bar  
“ to rise, and releases the whole of the traces therefrom, the  
“ horses passing onward carrying with them the end of the  
“ pole to which the bearing chains are attached, (which pole  
“ end I make to slip off) and the shoe break falls, being  
“ guided under the wheel or wheels by tie rods for that pur-  
“ pose.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, January 30.—No. 237.

BROWN, HENRY EDWARD. — (*Provisional protection only.*) —  
Axles and axleboxes. The following is the inventor's provi-  
sional specification:—"My invention consists in the con-  
" struction of axles, so that the end of the bed forms the  
" bearing for the inner end of the axlebox in place of the  
" ordinary collar for the same purpose, and with a collet,  
" which I prefer to be of gun metal, for the bearing of the  
" outer end of the box, such metal collet being kept to its  
" position by the pressure of a strong spring. By this  
" arrangement the box has a rigid bearing as usual at its  
" inner end, and an elastic bearing at its outer end; also, the  
" spring being substituted for the ordinary nut, the use of  
" washers is dispensed with, and the wear of the bearings is  
" compensated for by the elastic force of the spring, which  
" is kept in its place by a linch pin or other suitable means.  
" The tension of the spring when first placed on the nib of  
" the arm may be regulated, when required, by screwing  
" down a bolt upon the end of the nib, which is tapped to  
" receive it, and thereby working forward the box or socket  
" containing the spring into its required place. The oil is  
" supplied through a hole in the cap as usual, and thence  
" through a hollow passage in the arm, whence it issues  
" through a hole into a grooved chamber in the box."

[*Printed, 3d. No Drawings.*]

A.D. 1860, February 3.—No. 282.

HOWES, WALTER, and BURLEY, WILLIAM. — Attaching lamps and whip sockets. To use the words of the patentees “ in the interior of the ring which terminates the socket iron, “ we make a concave or female screw, and on the socket “ underneath the lamp we make a convex or male screw of a “ size proper to engage in the screw in the socket iron. In “ the case for a whip socket the screw is made on the middle “ of the said whip socket. By making the lamp socket or “ whip socket engage in the socket iron by means of screwing, “ a secure connection is effected free from the liability to “ shake, which the ordinary method of fastening is subject “ to. The accidental unscrewing of the lamp may be pre- “ vented by a small strap connected with the lamp being “ passed round the socket iron, and fixed in that position.”

[*Printed, 6d. Drawing.*]

A.D. 1860, February 4.—No. 294.

TAYLOR, JAMES.—(*Provisional protection only.*)—Traction engines and carriages. These improvements consist, firstly, in applying a hinged flange to wheels so that they may be used, when required for tramway purposes; a guard or fixed block fitted to the frame retaining it in position. Secondly, in fitting upon one axle, on excentric bushes, a flanged and a plain tired wheel, either of which may be used according to circumstances. Thirdly, varying the speed of engines, by means of friction cones, or by varying the radius of the crank, without stopping the engine; and when pitch chains are used, the inventor applies “ the double cones patented by Mr. Comb “ in 1856, No. 1387.” Fourthly, in applying struts or props to engines to enable them to apply their own power for the purpose of raising themselves out of hollow places. Fifthly, in boxing in all gearing, and sixthly in heating the feed water and diminishing noise of escaping steam by causing the latter to impinge on the tubes of a water heater.

[*Printed, 3d. No Drawings.*]

A.D. 1860, February 6.—No. 310.

BOYD, JAMES EDWARD.—Invalid carriages, &c. “ The carriage, perambulator or invalid or other chair ” is to be con-

structed so that the occupant may be placed in a sitting or recumbent position. For this purpose the seat is connected with the body by hinges and its change of position is accompanied by a simultaneous change of position of the foot board or front support of the seat. Or this footboard, the seat and the back panel of the carriage may be made in one continuous jointed piece and caused to adopt various angular positions. Grooved slots or recesses serve as guides and the unassisted hand in small carriages, and in larger with the help of "a rack ratchet, or spur and pinion" supplies the power. The body of the carriage may be removed from its wheels to form a hand chair or litter.

[*Printed, 4d. No Drawings.*]

A.D. 1860, February 8.—No. 344.

COCKER, JAMES.—(*Provisional protection only.*)—Passenger indicator and ladder for omnibuses. To enable a passenger to reach the roof of an omnibus a ladder is provided. To this ladder is fitted a shield which only exposes two steps at a time. This shield is carried by endless chains running over pulleys at the ladder top. Springs or weights supply the moving power. A passenger cannot ascend the ladder until the aperture in the shield is at the bottom; as he ascends the shield mounts with him and exposes the step for him. The edge of the shield projects slightly above the level of the step so that in descending the passenger himself works the shield. By this means only one passenger can be on the ladder at a time. A counter may be applied to the wheels over which the shield travels. To count the inside passengers, an apparatus is fitted to the doorway. Every passenger on entering moves a horizontal bar which operates on the counter or indicator.

[*Printed, 3d. No Drawings.*]

A.D. 1860, March 2.—No. 585.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Gustave Hamoir.*)—Nave. "This invention consists in forming upon the outside of a box or tube cylindrical or conical on the inside, according to the form of the journal of the axle or of the shaft on which it is to be placed, two discs at

“ right angles, or nearly so, to the outer surface of the box.  
 “ The inner ends of the spokes pass between these discs and  
 “ rest upon the box, where they are secured by the discs  
 “ being drawn and held together, so as to press so much  
 “ of the ends of the spokes as is contained between them.  
 “ One disc may be cast or otherwise formed in a piece with  
 “ the box, and the other may be a separate piece of metal  
 “ with a hole through the centre to slip over the box, the  
 “ movable disc being drawn towards the stationary disc by  
 “ means of screw bolts and nuts, or otherwise; or both discs  
 “ may be movable, and may be made to approach each other  
 “ and hold the spokes by means of screw threads. When the  
 “ spokes are to be fitted into the nave at an angle, the inside  
 “ of the discs is so shaped as to admit them at the required  
 “ angle. The spaces between that portion of the spokes com-  
 “ prised within the discs are filled up with blocks of wood.  
 “ The inner surfaces of the discs may be grooved or serrated  
 “ to give them a better bite upon the spokes, but this has not  
 “ been found necessary.”

[Printed, 6d. Drawing.]

A.D. 1860, March 26.—No. 775.

MARTIN, CHARLES, and PIDDING, WILLIAM.—(*Provisional  
 protection only.*)—Paper for carriage construction and other  
 purposes. “ This invention consists of a novel and improved  
 “ method of making paper, by passing the pulp or material  
 “ when prepared in the usual way or otherwise on to a hollow  
 “ air-tight cylinder of suitable diameter and width; connected  
 “ to its centre by means of a hollow shaft or spindle is a  
 “ vessel or vacuum chamber, which vacuum is maintained by  
 “ an air-pump operating upon it; the outer circumference of  
 “ the air-tight cylinder is made of finely perforated metal or  
 “ wire gauze, covered with flannel or other suitable material,  
 “ on to which, as it revolves, the pulp or other material used  
 “ is allowed to flow, and the liquid is abstracted by the  
 “ vacuum before named, leaving the pulp or material in a  
 “ proper state to be conveyed on to drying cylinders, also the  
 “ paper or material so made or otherwise cut into strips or by  
 “ the cylinder having divisions, or by a cylinder of suitable  
 “ width and form, and either in connection with such cylinder  
 “ or subsequently the spindle and fly as used in the manu-

“facture of cotton to convert such into string by giving to it the necessary throw or twist, and to size such paper or material, or to combine with it caoutchouc in liquid state while in the vessel or during its manufacture. The materials proposed to be used suitable for the different purposes required, animal or vegetable fibre, sawdust, glue resin, caoutchouc, lime, fatty and colouring matters, as may be necessary to render them hard, elastic, insoluable, or unflammable, as the case may be.”

Articles may be made of paper pulp by means of perforated or gauze moulds exhausted by the vacuum chamber.

[*Printed, 3d. No Drawings.*]

A.D. 1860, April 2.—No. 844.

PARTRIDGE, EBENEZER.—(*Provisional protection only.*)—“Improvements in axles and axle boxes.”

This invention consists “in forming the journal in a separate piece from the axle itself,” and in a certain mode of “uniting the parts and connecting them with the box.” The end of the axle proper is formed hollow for about four inches, more or less, and “it has a screw thread cut in the end which extends for about one inch and a half,” slots or apertures “extending through the thread and substance of the hollow end.” The journal “consists of a solid shaft, formed by preference conical at one end, to enter and fit into the hollow end of the axle. At the other end a screw thread is cut to receive the cap, and inside of the screw is a shoulder or collar, which, when in position, bears upon a washer placed between it and the outer end of the box. One or more holes is or are made through the conical part of the journal for the reception of a pin or bolt passed through holes made in the hollow part of the axle and through the journal. A screw-threaded nut, with a collar or ring on the outer end, is screwed over the thread on the hollow end of the axle, and, entering a flange on the inner end of the box, bears upon a washer placed between it and a ring formed on the inside of the box; the threaded nut is prevented from turning by means of a screw, which passes through a treaded hole made for its reception in the side of the nut, and enters one of the slots or apertures before alluded to in

“ the threaded end of the axle. Should there be any wear in  
 “ the washers, collars, or bearings for the same in the box, it  
 “ will be compensated for, and the whole will be rendered  
 “ tight by screwing up the nut and fixing it by inserting the  
 “ fixing screw in another of the slots or apertures through  
 “ the threaded end of the axle.”

The improvement in the boxes in which the journals revolve  
 “ consists in forming them of cast iron, with a cylindrical  
 “ steel centre or tube to receive the journals ; the steel centre  
 “ or tube may extend the whole length of the box in a con-  
 “ tinuous line, or it may be divided at or about the middle  
 “ with an aperture or opening between the two parts of the  
 “ bearing.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, April 7.—No. 881.

CLARK, WILLIAM.—(*A communication from James Hervey Deming.*)—Axle boxes. The axle box described by this specification contains friction rollers which bear against the axle journal, these rollers being lubricated by oil carrying projections or brushes on the journal. The object of the invention, however, is “ to prevent the escape of oil from railway axle  
 “ and other like journal boxes in general.” And the invention consists “ in combining with the journal box and journal  
 “ a cone upon the axle, interposed between the journal and  
 “ the face of the box through which the axle passes, the base  
 “ or larger end of the said cone being towards the journal.  
 “ By means of this combination all the oil which gets on the  
 “ axle, and which otherwise would travel along the surface  
 “ of the axle and finally escape from the box, is caused by  
 “ centrifugal action to travel up towards the base of the cone,  
 “ and is thereby retained in the box.”

[*Printed, 8d. Drawing.*]

A.D. 1860, April 17.—No. 965.

CARMONT, WILLIAM, and CORBETT, WILLIAM.—(*Provisional protection only.*)—Casting steel tires. This “ improvement  
 “ consists in running the molten steel in one mass into the  
 “ mould employed, and from one large opening, and after-  
 “ wards rapidly forcing the ‘core’ downwards or into the



“ molten mass, by means of screw or other mechanical or  
 “ steam power, thereby displacing the central portion of the  
 “ fluid metal and forcing it into the further extremities or  
 “ limit of the mould, by which means the casting is formed  
 “ or cast in one entire piece, and is consequently free from  
 “ such imperfections as are usually caused in casting at the  
 “ junction or meeting of the streams of molten steel.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, April 26.—No. 1051.

TRAIN, GEORGE FRANCIS.—Tramway car. The car intended for use in the line of way described by the patentee, travels, either end first, the pole being changed from one end to another as required. Cross arms are fitted to the pole to carry the swingle trees. A moveable bolt holds the pole in position.

The cars “ are formed with an oblong body, the whole of  
 “ the upper part of the sides of which have a series of glazed  
 “ sashes or windows, the lower portion of which can be  
 “ opened by sliding the sashes upwards, and are fitted with  
 “ framed Venetian blinds, which when not in use slide into  
 “ recesses below the window frames. Each end of the body  
 “ of the carriage is provided with a sliding door for admission  
 “ into the interior of the vehicle from a platform which is on  
 “ a level with the floor of the car, and is reached by steps  
 “ on the sides of the platforms, so that the vehicle can  
 “ be entered from each side at both ends. The roof is  
 “ extended over the platforms at each end, and is fitted with  
 “ seats which are gained by a small stair case formed in the  
 “ corner or corners (when more than one are used) of the  
 “ body of the machine, and approached from the platform.  
 “ The roof is provided with an awning for the protection of  
 “ the passengers from the action of the sun and from rain.  
 “ And it is proposed to attach the awning to a revolving  
 “ roller extended longitudinally above the centre of the top  
 “ of the car. A bell is fitted to each end of the roof of the  
 “ car which extends over the platforms, with a communication  
 “ extending along the interior of the roof, so that they may  
 “ be rung from any portion of the length of the car. The  
 “ body of the car is mounted upon two pairs of flanchd

“ wheels staked to their axles, which revolve in suitable axle box bearings, and are provided with any suitable springs, but it is preferred to use springs formed of india-rubber balls filled with air placed within cylinders, and are surrounded with molasses or other suitable liquid, the body of the carriage being supported on pistons resting upon the balls.”

“ The breaks used on this improved car are formed by a system of rods and levers, which can be worked from either or both platforms by the driver or conductor, or both, and act on all the wheels of the car at one time.”

[*Printed, 8d. Drawings.*]

A.D. 1860, April 27.—No. 1065.

THONET, FRANZ.—Wooden wheels. The inventor says, “ my invention consists in bevilling the inner ends of the spokes in such manner, that when the inner ends of all the spokes contained in the wheel are brought together, they form a solid and compact body with a space or circular aperture in the centre. I insert in this space or place before the inner ends of the spokes are brought together, and then bring them together round it, a pipe or tube, which I prefer to form slightly tapering on the outer surface. On one end of the tube, by preference, formed in a piece with it, there is a circular disc or plate, which, when the tube is in its place, rests against the inner ends of the spokes on one side. I then apply over the tube a disc of similar size to that before named, and with a hole through the centre, to enable it to be passed down over the tube, so as to enclose the inner ends of the spokes between the two discs. I use screw bolts, which pass through some of the spokes, and hold the two discs firmly together. I prefer to form the outer ends of the spokes with portions of the extreme end cut away, so as to leave a projecting pin, and to form an aperture in the felloe to receive the pin, and I do this to allow of the ready removal and replacement of any one or more spokes which require to be removed.”

[*Printed, 6d. Drawing.*]

A.D. 1860, April 27.—No. 1068.

NEWTON, WILLIAM EDWARD.—(*A communication from Charles Frederick Brown.*)—Wheels for gun carriages. Part of this invention relates to a method of mounting the improved form of gun described by the inventor, so that the discharge of the gun may be effected, if desired, by the rotation of the wheels in advancing or retiring. The first part of this invention, however, appertains to another series of abridgments.

“Another improvement relates to the mode of making the wheels of iron. The felloe is made of iron and has a groove cut therein to receive a disc or circular plate, to the centre of which is secured the hub or nave of the wheels. This hub or nave is formed of two parts which screw one into the other, the disc being between shoulders formed of the pieces for the purpose. The disc is made thicker at the centre than at the edge, which is made to fit the groove cut in the inner surface of the felloe which is shrunk on. To facilitate this operation, and to hold the disc securely, one edge of the groove cut in the felloe is made higher than the other and consequently acts as a shoulder for the disc to rest upon during the shrinking operation.”

[*Printed, 9d. Drawings.*]

A.D. 1860, May 9.—No. 1145.

DE BUYER, JEAN BAPTISTE JOSEPH. — Cast-iron wheels. “The nave is so made as to receive a wooden or a metal axle at will, and the spokes are placed at such distance apart that the wheel while possessing all the necessary solidity, shall not be of any great weight. The felly or outer circle of the wheel, which may be termed the tire, is more or less flat or rounded, according to the nature of the soil over which the wheel is to travel; a groove or circular cavity” is provided “in the interior of the nave which not only lessens the weight of the wheel, but also serves to receive and retain fatty matters, and consequently acts as a grease box.” “In some instances” it is advisable “to place in the outer circle or felly a ring of iron, round or nearly flat, at will, but in preference round if the felly be round or rounded, and half flat, or of hoop iron if the felly be half flat or more

“ or less flattened. This ring is imbedded in the cast iron,  
 “ and for this purpose in moulding every precaution is taken  
 “ to cover all parts of the circle with a uniform coating of  
 “ cast iron. When it is desired to give still greater strength  
 “ to the wheels,” the patentee ties to the “ circle of iron as  
 “ many iron rods as the wheel is to have spokes ” and covers  
 “ this skeleton with a sufficient and regular coat of cast iron.  
 “ And, finally, if it be desired that the nave be of forged iron,  
 “ an entire carcass or skeleton wheel ” is formed and covered  
 wholly or in part “ with cast iron. It will be found generally  
 “ advantageous to use wooden axles for these wheels, but iron  
 “ axles or axles partly of wood and partly of iron may be  
 “ used.”

[*Printed, 8d. Drawings.*]

A.D. 1860, May 10.—No. 1157.

WILSON, ALEXANDER.—Framing for carriages. This improvement “ in the construction of carriages, waggons,  
 “ trucks, and other vehicles for railway and common roads,  
 “ consists in building such carriages with lattice built iron  
 “ or steel frames, bodies, and under frames,” that is, “ frames  
 “ and bodies constructed of channel T-angle or flat iron bars  
 “ arranged diagonally to the side and end sole bars of the  
 “ carriage, and rivetted together where they intersect or cross  
 “ each other. Carriages framed upon the above principle  
 “ will possess great strength, stiffness, and durability, also  
 “ the weight of the same will be less than when constructed  
 “ in the ordinary manner.”

[*Printed, 9d. Drawing.*]

A.D. 1860, May 17.—No. 1214.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from J. L. Simon.*)—Brake. The details of this improvement cannot well be described without the assistance of the drawing. Generally, the brake consists of the usual block fitted at the end of a curved lever or rocking shaft pivotted so that by the application of force at one end, the other having the block is applied to the wheel. To the former end a cord is attached which passes between rollers and is then secured to a sliding futchell. This futchell is controlled

by a spring locking bolt, so shaped that according to its position the horses may be free to draw but will apply the brake by backing, or they may apply it whether they draw or back. The bolt is adjusted by a cord.

[*Printed, 7d. Drawing.*]

A.D. 1860, June 1.—No. 1351.

PARSONS, GEORGE.—(*Provisional protection only.*)—Framing and tail piece. The following is the inventor's provisional specification:—"In wagons, carts, and drays as usually constructed, the sides, summers, and breech, or tail piece at the hind part of the wagon, cart, or dray are tenoned together, whereby the structure is weakened. Now, the first part of my invention consists in forming the breech or tail piece of one or more bars of flat iron or of angle iron, and in connecting the sides and summers thereto by bolts, rivets, screws, or other like means.

"The second part of my invention consists in the employment of brackets of iron in place of what are termed 'porter irons.' These brackets are fastened to the sides by screws, rivets, or bolts, and iron porters rest upon and are screwed, rivetted, or bolted to the brackets and support the sides in a simple, strong, and efficient manner."

[*Printed, 3d. No Drawings.*]

A.D. 1860, June 7.—No. 1398.

BATH, JAMES PARKER.—(*Provisional protection only.*)—Wheels for tramways and common roads. "This invention consists of a simple appliance whereby common carriage wheels can be used on railways or tramways as well as upon ordinary highways, and consists of segmental guide plates, flaps or bars, suspended to the axle of the carriage, and extending down the inner side of the wheels, and a little beyond the periphery thereof, forming a flanch on the lower portions of the wheels to keep them in position when upon the rails. The segmental guide plates on each end of the axle are connected together by a transverse plate, or other suitable contrivance, and admit of a pendulous motion being given thereto to enable them to be lifted and held clear of the ground when the vehicle is running on common

“ roads, which is done by means of rods and levers or other  
“ mechanical equivalents under the control of the driver or  
“ other person. It is preferred to construct portions of the  
“ pendulous guides which are subject to friction so that they  
“ may be shod with steel or other suitable substance, and  
“ which can be removed for repair or renewal at pleasure.  
“ And in some cases it may be deemed advisable to fit the  
“ pendulous flaps with antifriction wheels or rollers working  
“ on a vertical or oblique axis.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, June 11.—No. 1428.

DE TIVOLI, VITAL. — Ambulances. These ambulances are for civil and military purposes. They differ slightly in details of construction, but are generally on the same plan. They are fitted with stretcher or chair beds, with rests and having castors running in grooves in the carriage floor. The light or flying ambulance is on two wheels and has four beds; the large ambulance has four wheels and six beds. They are arranged in two tiers and the carriages are fitted with medicine chests and magazines. A gallery on the top is used for arms, stores, &c.

[*Printed, 10d. Drawing.*]

A.D. 1860, June 16.—No. 1465.

COATES, CHARLES. — (*Provisional protection only.*)—Brakes. The nature of this invention “when applied to carriages for  
“ high roads consists in applying an internal break to the  
“ nave or naves of the wheels. This break consists of an  
“ excentric fixed to the axle, and on this excentric is a move-  
“ able cam furnished with leather or other suitable material  
“ acting on an internal flange fixed to the nave of the wheel;  
“ a pin or stud from the cam takes in a radial slot in a plate  
“ which is loose on the axle, and to which a lever is attached  
“ to which the power for applying the break is connected.  
“ When the break is applied to two or more of the wheels on  
“ the same carriage, the cords or straps connected to the  
“ levers are taken through the eyes of levers fixed to a shaft,  
“ to which the handle for working the breaks is applied.  
“ The mechanical arrangement for connecting the power to

“ the breaks may be considerably varied, and the arrangement of parts forming the internal break may also be modified.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, June 29.—No. 1575.

TAYLOR, JAMES.—Traction engines. This invention consists in part of improvements on the invention, No. 2548, A.D. 1858. In the previous specification an engine was described which had four wheels, the leading pair being used for steering, the other pair for driving. According to the present invention an engine may have three or four wheels, the steering wheel or wheels being placed in rear of the drivers. The steersman may be in front or behind. In constructing an engine with three wheels, the patentee forms “ a frame for receiving the short axle ” and interposes “ india-rubber or other springs therein, and between the axle bearing, sliding therein, and the top of each guide or frame and instead of connecting or securely fixing such frame to the under side of a ring or kerb formed of angle-iron, working into or against another ring or kerb, by forming a groove it is made to contain the means of constantly lubricating and also of steadying the carriage, whilst it admits of the wheel freely revolving.” A rack round the wheel frame serves for steering. India-rubber springs are applied to the boxes of the driving wheels. The latter which are of wrought and cast-iron combined are driven in various ways by gearing. Instead of fitting projecting arms to the “ face of the driving wheels,” the patentee either hoops “ the wheels with one or more central projecting hoops of any convenient strength, or such hoops may be placed on the outer sides or extremities of the driving wheels, the circumference or rounding surface of which may be of cast iron, having recesses of L, Z, or other convenient form cored therein.”

Another part of the invention relates to trucks or other carriages which are intended to be formed into trains and drawn by steam or other power, the patentee stating that whether such trucks or carriages be on three or four wheels, he so constructs them and arranges the steering apparatus as to ensure their following in their track. For this purpose he takes a tail lever or tiller bar from the front of the fore

or leading wheels, and places it between two horns or studs projecting from the top or the bottom side of the hind axle of the preceding truck; "thus, on the first truck turning to the right or to the left the studs or horns cause the tail lever or tiller to be correspondingly acted on. The trucks are coupled together by means of links or hooks." When the trucks or carriages have three wheels only the single wheel is arranged in connection with a wheel plate and rings in a manner similar to that adopted in the construction of the traction engine, in which grooves are arranged for the lubrication of the parts, the axle of such wheel being mounted in a suitable frame, and the axle bearing being provided with india-rubber springs. "With this steering arrangement and mode of connecting a perfect pivoting is ensured, and a correct vermicular action can be obtained throughout a train composed of any number of trucks or carriages."

The invention includes a certain arrangement of portable locomotive engine which is more particularly intended as a self-moving hoist or travelling crane, but which may be likewise used for drawing or hauling and as a traction engine, and which may be used either upon edge rails or upon a common road, or on a wharf wall, or in any situation in which it may be conveniently employed for loading ships loading and unloading waggons and other purposes. The wheels are in one arrangement fixed upon the axles, and motion is communicated to them through the medium of gearing which may be arranged either as a differential motion or otherwise, "Or when such engines are employed upon railways having many curves the propelling power may be applied to the wheels on one side thereof, and the wheels on the opposite ends of the axles left free to revolve independently."

*[Printed, 2s. 3d. Drawings.]*

A.D. 1860, July 16.—No. 1711.

HENSON, WILLIAM FREDERICK.—Springs. This invention has relation to the employment of volute or spiral springs, and consists essentially in the application of "a conical or conoidal plunger, or piece of metal or other suitable material, with a spiral step or groove, somewhat similar to the fusee of a watch, in such a manner that as the pressure on the volute spring increases, this conical plunger comes



“ in contact with the convolutions of the spring one after  
“ another, commencing with the central convolutions and  
“ terminating with the exterior ones, until all further motion  
“ of the spring is arrested.” The particular form of the  
plunger may be varied, and when a spring “ is to be exposed  
“ to tension or compression on two opposite sides,” a plunger  
may be applied on each side of such spring. And the springs  
may be formed of steel, “ of a trough or groove section,” or  
of “ a hollow tubular section at one end, and gradually  
“ flattened towards the other end;” or of a trough or grooved  
section, “ with the sides flattened towards the one end, and  
“ opened out towards the other end.”

Various modifications of the invention are described.

[*Printed, 10d. Drawing.*]

A.D. 1860, July 20.—No. 1758.

DICKINSON, JOSEPH.—Brakes. The object of this invention  
“ is to retard the motion of and to stop railway trains and  
“ other carriages.”

The patentee describes the application of the invention to a  
railway train, thus :—“ I connect a fast and a loose pulley or  
“ other suitable apparatus to the axle or other revolving part  
“ of the locomotive engine or tender, or to any or all the  
“ carriages, trucks, or vans of which the train is composed;  
“ or the fast and loose pulley or other apparatus may be  
“ applied to an additional shaft connected by gearing or  
“ otherwise to the axles. A strap or cord connected to the  
“ break passes around the pulleys, and is traversed laterally  
“ from the fast to the loose pulley, or vice versâ by means of  
“ guides connected by chains, cords, and levers, or other  
“ connection to the guard’s van, or to the engine, or to any  
“ or each carriage of the train. When it is requisite to retard  
“ or stop the train the straps or cords are moved from the  
“ loose to the fast pulleys, thereby causing the breaks to be  
“ drawn with great force against the wheels. The breaks are  
“ suspended near the lower portion of the circumference of  
“ the wheels, so that when released they hang free from the  
“ wheels by their own gravity, or each break may be furnished  
“ with a counterpoise.”

[*Printed, 4d. No Drawings.*]

A.D. 1860, July 24.—No. 1789.

THOMAS, REBECCA.—(*Provisional protection only.*) Securing tires to wheels. The following is the inventor's provisional specification :—" This invention has for its object the securing  
" of tires on wheels more effectually than heretofore, so that  
" in the event of the tire breaking, it will nevertheless remain  
" attached to the felloe of the wheel. The following is an  
" example of the means by which I propose to effect the  
" object of this invention, that is to say :—I form the tire of  
" the wheel with lugs or projections on the edges thereof, at  
" certain distances apart, the lugs on one edge coming oppo-  
" site to the spaces between the lugs on the other edge ;  
" these lugs are intended to embrace the felloe of the wheel,  
" and may be connected thereto by screws passed through  
" said lugs, or by bolts and nuts, or the said screws or bolts  
" may pass through the tire and felloe, or be secured to the  
" tire and wheel in any other convenient and suitable  
" manner."

[*Printed, 3d. No Drawings.*]

A.D. 1860, July 25.—No. 1797.

LEVERSON, MONTAGUE RICHARD.—(*A communication from William Hogg Brown.*)—Springs. The application of this improvement is shown in the case of a railway truck, though it is applicable also to common road carriages. Two semi-elliptic leaves or plates are used. At one end they are attached to the framing or horn plates ; at the other end to the axle box. The effect of loading the vehicle is to depress the horn plates and at the same time to elongate the springs.

[*Printed, 9d. Drawings.*]

A.D. 1860, August 2.—No. 1867.

PARTRIDGE, EBENEZER. — Axles and axleboxes. The patentee says " my improvements in axles consist, first, in  
" forming a screw thread on the ends of axles or in the outer  
" ends of the journals of axles, with one or more longitudinal  
" slots cut in the thread, but not extending through the  
" thickness of the axle ; in forming a nut to screw over the  
" thread with holes round the circumference thereof ; and in

“ the employment of a screw or pin for passing through one  
“ or other of the holes in the nut into one of the longitudinal  
“ slots in the said thread. By removing the pin the nut can  
“ be turned to tighten up the axle when required, and it can  
“ be retained in the desired position by dropping the pin into  
“ the slot through one or other of the holes round the nut.  
“ My invention also consists in the employment of a cap,  
“ which I screw on to the inner end of axle boxes, to prevent  
“ the axle, should it break at or about the inner end of the  
“ journal or elsewhere inside the box, from getting away from  
“ the box, whereby the axle is prevented from falling and the  
“ wheel from running off; the cap bears against the collar on  
“ the axle, and is secured in its place by driving a screw pin  
“ through the box into a tapped hole in the cap. My inven-  
“ tion further consists in forming the boxes in which the  
“ journals or ends of axles of railway and common road  
“ carriages enter, of cast iron, with a cylindrical steel centre  
“ or tube to receive the journals or ends of the axles; the  
“ steel centre or tube may extend the whole length of the  
“ box in a continuous line, or it may be divided with an  
“ aperture or opening between the parts of the bearing for  
“ holding lubricating matter.”

[*Printed, 5d. Drawing.*]

A.D. 1860, August 3.—No. 1886.

STEPHENS, JOHN.—(*Provisional protection only.*)—Portable railway. Instead of connecting the blocks or short rails which usually constitute portable railways, by their ends, the inventor connects their centres by means of chains or bands. This arrangement facilitates the turning of the carriage. The bearing blocks may be flanged. For very rough lands, however, the blocks should be connected at points nearer their ends. To assist the blocks out of a tenacious soil, “an incline” is mounted on “an arm carried by the vehicle” which just as the bearing block has to be raised comes against a pin or projection at the end of it, which is furthest from the wheel and tilts it; after which it is easily lifted as the wheel travels on.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, August 7.—No. 1907.

NEWTON, WILLIAM EDWARD.—(*A communication from Jules Piault.*)—(*Provisional protection only.*)—Brakes. “The breaks  
“are brought into action automatically, and are made to  
“bear on the wheels of the carriage by simply arresting the  
“progress of the horses. In order, however, to prevent  
“accidents in the event of the horses running away or  
“refusing to obey the driver, it is proposed to adapt to the  
“apparatus a winch handle or other suitable and convenient  
“contrivance, whereby the coachman may be enabled to bring  
“the breaks into action when required by simply giving the  
“handle a few turns. The splinter bar or whipple trees to  
“which the traces are attached are connected with levers,  
“which are made to act by means of connecting rods or other  
“analogous mechanical appliances on the break levers, so  
“that by checking the progress of the horses, as when going  
“down hill, the draught will be taken off the levers, and the  
“breaks will, by means of strong springs, be forced against  
“the wheels, and the progress of the carriage will be thereby  
“retarded. Immediately, however, the animals begin again  
“to pull against the levers (as when going up hill or on level  
“ground) the breaks will be drawn away from the wheels.  
“By means of the winch handle before mentioned the driver  
“will, however, have command over the breaks, so that he  
“may be enabled, if required, to skid the wheels, independent  
“of any action of the horses. Provision may also be made  
“for preventing the breaks from acting against the wheels  
“when the carriage is being backed.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, August 13.—No. 1952.

ORANGE, EMMA BENJAMIN.—(*Provisional protection only.*)—  
Releasing runaway horses. This invention consists “in joining  
“the two parts of each shaft by means of sheaths or cases  
“fixed to the fore parts to which the traces are attached, the  
“back part of the shafts being set in these sheaths and there  
“maintained by bolts traversing corresponding mortices in  
“the sheaths or cases and in the shafts. These bolts are  
“simultaneously withdrawn, but in opposite directions, by  
“means of rods with rack and pinion, and of a toothed sector

“ set in motion by a cord within reach of the driver. As  
 “ soon as the bolts leave the mortices the fore parts of the  
 “ shafts separate from the hind parts, and are carried away  
 “ by the horse, leaving the carriage behind. In some cases  
 “ the fastening securing the cross bar to the two shafts may  
 “ be made to act in the same way as the bolts above men-  
 “ tioned. When two horses are harnessed to the carriage, by  
 “ a slight modification of the same apparatus, the trace bars  
 “ (there being no shafts) are released and carried off by the  
 “ horses, together with the chains by which they are attached  
 “ to the pole.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, August 15.—No. 1982.

SAMUEL, JAMES, and TRAIN, GEORGE FRANCIS.—Wheels and axles. The first part of this invention relates to the construction of reversible rails for tramways.

The improvements in wheels “ consist in constructing them  
 “ with tires, about one-half of the breadth of which is of a  
 “ different diameter to that of the remaining portion; wheels  
 “ thus fitted will be capable of running (bearing upon one-  
 “ half or nearly so of the breadth of the tyres) upon the raised  
 “ part of” the patentee’s “ rails, while they can bear upon  
 “ the other half or thereabout of the breadth of the tyres and  
 “ travel upon ordinary roads.” The “ improvement in axles  
 “ consists in the employment of two separate axles superposed,  
 “ or one behind the other, one end of each axle having a  
 “ wheel on it, while the opposite end carries no wheel.” The  
 objects in this improvement are “ to enable carriages to travel  
 “ round sharp curves without straining the axles, and to  
 “ reduce friction in rolling round curves.”

[*Printed, 11d. Drawings.*]

A.D. 1860, August 27.—No. 2057.

MENNONS, MARC ANTOINE FRANÇOIS.—(*A communication from Augustin Joseph Cambon*).—Antifriction axles. “ These im-  
 “ provements consist in the application of hard metal spheres  
 “ of unequal diameters to the working surfaces of axle boxes  
 “ and axle-bearings of machinery and rolling stock of all  
 “ kinds. In each end of the axle-boxes constructed on this

“ system is placed a metallic collar, round the outer circumference of which is formed a groove or canal. Around this groove is distributed any desired number of hard metal spheres in pairs of unequal dimensions, and over these spheres is fitted a second grooved collar formed in the metal of the box or inserted therein. The arrangement is completed by the insertion of the axle end in the inner collar to which it is keyed or otherwise secured. The same system is carried out in the construction of axle bearings, the spheres being distributed round the axle, either with or without the interposition of the moveable collars, the latter being, if so desired, replaced by corresponding grooved bands cast on or fitted to the extremities of the axle itself. The ranges of spheres in each box or bearing may vary in number from one or two upwards, according to the nature of the machinery to which they are adapted, but, for ordinary purposes, the double series as above is most advantageous. The diameters of the spheres also vary according to the dimensions of the machinery, and the nature of the movement.”

[Printed, 9d. Drawing.]

A.D. 1860, September 7.—No. 2160.

TRAVIS, JOSEPH SIDDALL.—(*Letters patent void for want of Final Specification.*)—Traction engines. “ These improvements consist in working traction engines by means of two steam cylinders, the pistons of which move at a great velocity, and communicate rotary motion to two crank shafts, which can be worked independently of each other, or coupled by a friction clutch box ; on each crank shaft is fixed a fly wheel and a spur pinion gearing into an intermediate mortice wheel, the teeth of which gear into internal cog wheels, cast or fixed to the driving wheels ; these driving wheels are loose on the axle, and their circumferences are bevelled to suit the road on which they run ; the boiler,” which it is preferred to place vertically, “ is supported by the axle of the driving wheels and by the framing, and it is surrounded by a cistern and casing, which are in communication with the supply tank ; the feed water is thus heated before it is pumped into the boiler, and one or more safety valves are applied to the casing to allow for the

“ escape of steam. The piston rods from the steam cylinder  
 “ pass through a portion of the cistern, into which water can  
 “ be admitted if, owing to the great speed of the engines, the  
 “ working parts should become heated. The valves for the  
 “ steam cylinders are opened and closed by separate regu-  
 “ lators, but a third regulator, capable of working the valves  
 “ of both cylinders simultaneously, is provided. When the  
 “ engine is working on a straight road the crank shafts are  
 “ connected by the clutch box, but in turning to one side or  
 “ the other the clutch box is thrown out of gear by a handle,  
 “ which is brought into a convenient position for the steers-  
 “ man or driver, and then one of the steam engines is driven  
 “ rather faster than the other, in order to move the traction  
 “ engine either to the right hand or the left, as may be re-  
 “ quired. Each steam engine is also provided with a revers-  
 “ ing motion similar to the link motion of a locomotive  
 “ engine, in order to be able to reverse the direction of motion  
 “ instantaneously. The chimney is furnished with a wire  
 “ guard and a hood to prevent the escape of particles of fuel,  
 “ and to reduce the noise made by the steam in blowing off.  
 “ The front part of the carriage is supported by two wheels and  
 “ an axle, or by a roller, as may be found most convenient.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, September 11.—No. 2195.

PEACOCK, DAVID, and TRUMAN THOMAS RICHARD.—(*Pro-  
 visional protection only.*)—Wheels for traction engines. “ The  
 “ tire or periphery of the wheel is constructed with slots, in  
 “ which slots are placed bearing pieces or teeth of a tri-  
 “ angular form (converging towards the nave) the same  
 “ respectively working on pins or bolts passing through the  
 “ hypothenuses thereof, and secured in the periphery of the  
 “ wheel, the effect of such arrangement being to bring the  
 “ centre of the external or bearing surfaces of the bearing  
 “ pieces or teeth, which are perfectly straight or slightly  
 “ curved, flush or level with the external surface of the tire of  
 “ the wheel. As the wheel revolves, the angular ends of the  
 “ bearing pieces, which are posterior to the line of progression,  
 “ project in such a manner as to act as pawls in gripping or  
 “ scotching the earth in the event of the wheel having a  
 “ tendency to slip. Instead of the bearing pieces or teeth

“ being arranged and working in slots, as before-mentioned,  
 “ they may be placed and fitted on the exterior of the wheel  
 “ or between two wheels, or the rim or periphery of the wheel  
 “ may be formed entirely of such bearing pieces or teeth  
 “ mounted and secured on suitable arms radiating from the  
 “ centre or nave.

“ A spring or springs or other suitable arrangement may be  
 “ employed to keep the bearing pieces or teeth in position.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, September 25.—No. 2328.

MANNIX, JAMES BALL.—(*Provisional protection only.*)—“ An  
 “ improved wheel to be used for carriages or other purposes.”

This invention “ has reference to an improved construction  
 “ of wheel to be used in lieu of the ordinary driving or run-  
 “ ning wheels of carriages, or invalid chairs, strap wheels or  
 “ otherwise, and consists in the wheels being provided with  
 “ double sets of tires, placed concentrically one within the  
 “ other in such manner as to admit of the same being held  
 “ together or united through the medium of elliptical or bow-  
 “ formed springs placed between the same, and working from  
 “ an adjusting link head motion for communicating the  
 “ requisite play or elasticity to the wheels, whereby the con-  
 “ cussion consequent on the rolling action is obviated, and  
 “ the wheels rendered capable of being employed if necessary  
 “ without bearing springs as at present.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, October 3.—No. 2395.

COLE, RICHARD JOHN.—Ornamenting carriage windows. The  
 patentee says, “ I use either plain, flowered, lace pattern, or  
 “ bordered glass, with clear centres or spaces, within which I  
 “ place or transfer chromo-lithographs, photographic pictures,  
 “ or other impressions, prints or paintings, and attach the  
 “ same to the surface of the glass by suitable transparent  
 “ cement or varnish as a protection against damage from  
 “ moisture or other atmospheric influence.

“ The lace or flowered borders may be produced by any of  
 “ the known means, and may be either matted or tinted, or  
 “ partly plain and partly tinted, or plain ground borders may



“ be used, and in some instances the entire surface of the  
“ glass may be covered with the ornamental design or in  
“ colours.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, October 5.—No. 2415.

RICKETT, THOMAS. — (*Provisional protection only.*) — Locomotive for common roads. After describing the construction of the boiler, with a water tank beneath it, the inventor proceeds to describe the remaining parts of his improved locomotive. He says “the power is communicated from the crank shaft to  
“ the main axle by spur gearing, giving two different speeds ;  
“ one carrying wheel is fixed upon the axle, whilst the other  
“ wheel is loose thereon, so that one or both wheels may be  
“ driven as required. The crank shaft revolves in fixed bear-  
“ ings, and the main axle revolves in pedestal bearings between  
“ guides placed at right angles to the crank shaft. A small  
“ wheel is placed in front carried by a fork which is used for  
“ steering, and each wheel carries its load through the medium  
“ of a spring. When it is desired to avoid the noise and  
“ appearance of the escaping steam, or to reduce the requisite  
“ supply of water, I form a series of chambers made of thin  
“ sheets of metal into which the steam enters on being dis-  
“ charged from the cylinders ; these chambers are constantly  
“ exposed to currents of air caused either by the motion of the  
“ engine in travelling by the natural ascent of air, specifically  
“ lighter from receiving heat, or by the action of a fan driven  
“ by the engine, by which means the heat is abstracted from  
“ the steam, which is condensed to water and forced again  
“ into the boiler. Where an unusual amount of tractive  
“ power is required, I form or place outside each main engine  
“ wheel a chain pulley, and on each side of the main pair of  
“ waggon wheels forming the train I place other chain pulleys  
“ proportionate in size to the respective diameters of the  
“ wheels, an endless chain passes round the engine chain  
“ pulley, and the first waggon chain pulley, and another from  
“ the first waggon chain pulley to the second waggon chain  
“ pulley, and so on both sides, so that each side of the train  
“ of waggons is coupled with the engine, and the adhesion  
“ of the whole train is obtained.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, October 8.—No. 2435.

NEWTON, WILLIAM EDWARD.—(*A communication from John E. Jerrold, John Eugene Beggs, and Francis Scott.*)—(*Provisional protection only.*)—Springs. The following is the provisional specification :—“ This invention consists in the employment  
“ for the purpose of producing a car spring of a closely wound  
“ coil made of one continuous or of several thin strips of sheet  
“ steel or other suitable material, and retained in its form by  
“ two clamps, which are provided with pivots, and form the  
“ guides for the spring. The invention consists also in the  
“ combination with this closely wound coil of a band, the  
“ sides of which form the guides for the clamps, and which is  
“ so proportioned in relation to the coil that it checks the  
“ motion of the spring beyond a certain limit.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, October 10.—No. 2471.

WHITBY, TIMOTHY, and DEMPSEY, WILLIAM.—Applying springs to vehicles. “ This invention has for its object improvements in applying springs to railway trucks, and to  
“ railway and other carriages. For these purposes the horns  
“ between which the brasses or bearings of the axles slide, in  
“ place of being in a vertical position are fixed in an inclined  
“ position, and the springs are arranged to act in a line  
“ parallel with the inclined direction of the horns. The  
“ springs may be applied above or below the brasses or bearings of the axles, or both above and below. The construction of springs which it is preferred to employ in carrying  
“ out the invention, is such as are wound into spiral and  
“ conical forms, but other constructions of springs may be  
“ used.”

[*Printed, 6d. Drawing.*]

A.D. 1860, October 18.—No. 2543.

NEWTON, ALFRED VINCENT.—(*A communication from Thomas Castor.*)—Passenger carriages. “ To permit of the usual light  
“ materials being used for the roof, and at the same time to  
“ strengthen it so as to enable it to sustain the weight of  
“ outside passengers walking to and fro over the roof, a  
“ double seat is provided for the outside passengers with a

“ back running along the middle of the seat. This seat is  
 “ constructed on the truss beam principle, and bears only on  
 “ the framework at the opposite ends of the carriage. To  
 “ increase the stiffness of the roof, without adding to its  
 “ weight, it is connected with the trussed seat by pendent  
 “ bolts at suitable distances apart. To either end of the  
 “ carriage a detachable spiral ladder is applied to facilitate  
 “ the ascent of passengers from the platform to the roof, the  
 “ ladder being so connected to the carriage as to be readily  
 “ detached and applied to the opposite or rear end of the  
 “ carriage. Projecting from the body of the carriage at each  
 “ end thereof is a platform for the driver, and over these  
 “ platforms the roof projects to form landing places for the  
 “ passengers.

“ The ladder by which they ascend to the roof consists of a  
 “ central pole or rod surrounded by radial arms which form  
 “ the rounds of the ladder, and these are connected together  
 “ at their outer ends by a helical rib. The lower end of the  
 “ central pole fits into a suitable socket carried by the plat-  
 “ form, and the upper end of the ladder is secured by pins  
 “ or bolts to the roof of the carriage. To afford every pro-  
 “ vision against accidents to passengers ascending and de-  
 “ scending from the platforms, adjustable guards covering  
 “ the wheels are brought under the control of the driver, who  
 “ can raise them at pleasure (by means of rock levers) free  
 “ from any obstruction on the track, their position being  
 “ maintained by the aid of notched guides. Above the roof  
 “ a light awning frame is erected to receive an awning for  
 “ protecting the outside passengers from the sun or rain, and  
 “ around the roof a hand rail is applied to prevent passengers  
 “ from falling off the carriage. Where the roof is arched or  
 “ rounded it is necessary to place footboards in front of the  
 “ seats.”

[*Printed, 10d. Drawing.*]

A.D. 1860, October 23.—No. 2586.

HEADLAM, THOMAS WILLIAM.—(*Provisional protection only.*)  
 —Stuffing seats. The inventor says “ I propose employing  
 “ india-rubber balls for the purpose intended; these I place  
 “ between two thicknesses of canvass or ticking, and secure  
 “ them in their places by a stitch or button between each.

“ Thus it will appear that when any pressure is applied to the centre of the outer surface, it is distributed over the whole number of balls, the outer ones feeling less than those where the weight is immediately applied. This mode of stuffing being more particularly applicable to chairs, couches, omnibus and cab seats, cabins of vessels, and other purposes where stuffing is desirable.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, November 1.—No. 2677.

BETTYES, JOHN.—Carriage framing and springs. “ Heretofore in constructing the bodies of carriages it has been usual in forming the framing for a body of a carriage, where doors are used, to erect a corner post or pillar at each of the corners, and to frame into these posts or pillars horizontal rails forming the top and bottom of the panel, and at the sides are framed into these posts or pillars other horizontal rails connecting the corner posts or pillars with posts or standing pillars to which the doors are hung, forming with these pillars or posts the frames of two other separate or side panels. Whereas according to the present invention in constructing bodies of carriages where doors are used, in place of forming the frame for a body in the manner above mentioned, no corner posts or pillars are employed, on the contrary, one large curved or bent panel is used in each case, the top and bottom rails of which are formed of bent timber, and each rail at its ends is framed into the posts or standing pillars to which the doors are hung, or against which they shut. The peculiarity of this part of the invention consists in combining the ends of bent rails with the standing or door pillars of carriage bodies. Heretofore curved or **C** springs have been applied to suspend the bodies of carriages in various ways. Now, part of this invention consists in applying what may be called inverted **C** springs (thus **∩**); the upper end of the inverted spring is in the case of a hind spring connected to a metal bracket or scroll (or ‘body hoop’) springing from the body of the carriage, the spring then passes down behind the axle and underneath it, then rises up in front of the axle, and is jointed with couplings and fixed with clips on the axle, a link being used connected at one end to the

“ clip, and at the other end to the bracket or scroll, which  
“ prevents the axle lagging behind. In case of a fore spring,  
“ the direction above explained is reversed.”

[*Printed, 9d. Drawing.*]

A.D. 1860, November 3.—No. 2697.

SHILLIBEER, GEORGE, and GILES, GEORGE.—Omnibus. This invention relates to improvements upon the form of carriage described in the specification of the letters patent granted to the same inventors, dated 28th Oct. 1857. The omnibus body is formed in two compartments with a longitudinal central passage from end to end. In the hind compartment the passengers on each side sit vis-a-vis; in the other compartment each side faces the other. Between the compartments on each side and ascending out of the passage are the steps to the roof seats. In the previous specification these seats were shown as arranged vertically. Here they are inclined for greater convenience or they may be divided into sets to be used by the right and left feet alternately. The roof seats are transverse to the central passage and are fitted with a hood, made of some waterproof fabric supported on wood slats, which may be drawn when necessary.

[*Printed, 7d. Drawing.*]

A.D. 1860, November 6.—No. 2717.

HEWITT, WILLIAM.—Whip socket. This invention “ consists  
“ in the introduction into whip holders or whip sockets of  
“ springs or strips of steel, properly hardened and tempered,  
“ of a length nearly equal to that of the whip holder or socket  
“ with which they are used. The said strips of steel are bent  
“ near each end so as to give them somewhat of a bow shape;  
“ the said springs are covered with soft leather or other soft  
“ material.”

[*Printed, 6d. Drawing.*]

A.D. 1860, November 8.—No. 2746.

CUTTS, JAMES.—(*Provisional protection only.*)— Passenger counters. To put in operation the consecutive registering apparatus the motion is derived either from a double turnstile, which is “ specially suitable for use on omnibuses at the

“ inside entrance, and on or near the top of the ladders or  
“ passage to the outside, from the small space it occupies,”  
or from a series of cross arms or levers hinged on an upright  
pillar or spindle, one of which arms when moved to admit  
ingress, allows another to fall into place to count for the next  
movement; or by an arrangement consisting of an obstructing  
lever which when raised throws out two horizontal levers  
which must be moved before the way is clear. Ladders may  
also be suspended by india-rubber springs, so that when a  
passenger mounts, his weight communicates movement to  
the registering apparatus. The consecutive registering appa-  
ratus is an application of the arrangement used in paging  
machines.

[*Printed, 3d. No Drawings.*]

A.D. 1860, November 26.—No. 2894.

TRAIN, GEORGE FRANCIS. — (*A communication from Ralph  
Nowell Musgrove.*) — “ Improvements applicable to street  
“ railway carriages part of which are suitable for other  
“ purposes.”

This invention consists mainly of improvements in the  
railway omnibuses used on the improved system of street rail-  
ways for which a Patent was granted to the present patentee,  
A.D. 1860, No. 1051.

The first part of this invention consists of “an improved  
“ rail clearer, one, to be carried in front of each of the  
“ leading wheels of railway cars.” This improved rail clearer  
is composed of a piece of metal or other suitable substance,  
“ having the under side thereof formed to coincide with the  
“ contour of the section of the rails, and at the front pointed  
“ vertically so as to cause it to remove obstructions either to  
“ one side or the other of the rails. These improved rail  
“ clearers are mounted on suitable arms projecting from the  
“ carriage frame, and are carried immediately above and in  
“ close proximity to the rails, a little in advance of the  
“ leading wheels.”

The second part of the invention consists in an improved  
folding seat, which is peculiarly suitable for the drivers or  
conductors of railway omnibuses, such seat consisting of a  
flap which is jointed to the side or end of the vehicle in such

a manner as to be capable of being folded upwards, a metal rod being connected to or near to the front edge thereof, and being provided with a stop, which on the flap being lowered and the lower part of the rod passed through a hole in the platform of the vehicle, retains the flap in a horizontal position, the rod resting in a notch formed in a metallic projection when the flap is raised.

Another part of the invention relates to "a peculiar description of spring slide" which is meant to prevent the windows of railway omnibuses and other vehicles from rattling, this slide consisting essentially of a "wedge-sided" piece of metal, which is pressed against two parallel pieces of metal (of which the inner sides are bevilled to receive it) by a helical spring.

Another part of the invention relates to a catch or bolt for the windows and shutters of railway omnibuses and other carriages, this catch or bolt being S-shaped and actuated by a vertical bar furnished with a small projection which abuts against the under side of the upper curve of the bolt or catch.

Another part of the invention relates to improved catches and handles for the sliding doors of railway omnibuses or "other sliding screens," this part of the invention consisting of a bent lever working on a transverse axis, the inner arm of the lever projecting upwards, and the lever being fitted into a suitably shaped mortise lock frame or box. The outer end of the lever is formed with a latch hook and has in one side a recess for the reception of a spring, one end of which rests against the inner side of the back of the lock box, and the other against the upper limb of the lever, this spring depressing the outer end of the lever, on which is the latch hook. A staple of the ordinary kind is used, and the latch is disengaged when necessary by means of handles, which are combined with certain vibrating pieces of metal carrying studs, a vibrating lever, and other mechanism, this part of the invention being set forth at some length.

[Printed, 7d. Drawing.]

A.D. 1860, November 26.—No. 2895.

TRAIN, GEORGE FRANCIS.—(*A communication from Messrs. Grice and Long*).—"Steam carriages and running gear for "street and other railways."

This invention relates more particularly to carriages for street and other railways "having sharp curves." The body of the carriage is by preference constructed "of an enclosed oblong form, having a stage or platform at each end, one of which serves to enter the vehicle by, and the other to carry the engine and boiler," the latter being so formed as to allow the frame of the engine to be brought down almost into contact with the driving wheels. The boiler is placed on one side of this platform, and the engine on the other, leaving a space between them for the engineer. The water tank is placed in the rear of the boiler and engine, or it may be extended lengthwise beneath the seats in the body of the car.

The engine consists of two cylinders placed at an angle of say, about  $30^{\circ}$ , and the piston rods working through the lower ends thereof, and the connecting rods being coupled to a pair of crank arms on the ends of a transverse toothed or friction pinion shaft which actuates a large toothed or friction wheel on the axle of the driving wheels of the carriage. Or in place of toothed or friction gear, an endless chain band may be used to convey motion from the shaft to the axle.

The hinder part of the carriage, instead of being furnished with an axle and wheels in the ordinary manner, is mounted upon a truck having either one or two pairs of wheels with transverse axles, this truck being connected to the body of the carriage by a vertical pin which projects through the bottom of the carriage in advance of the truck wheels, and through a hole in the fore part of the truck which is "elongated for the purpose;" or a fixed arm, having a vertical hole through the outer end thereof may be used, instead of extending the truck frame beyond the running wheels. The truck frame is provided with antifriction rollers so arranged as to form part of a circle, in the centre of which is the vertical pin, and the bottom of the body of the carriage is provided with curved plates which rest upon the rollers, this arrangement allowing the vehicle readily to pass round sharp curves. "The object in using two trucks is that the vehicle can be driven either end first," and when drawn by an engine, "the front truck would require to be locked," while when drawn by a horse or other animal it may be allowed to turn under the body of the vehicle.

To prevent undue vibration at the rear end of a carriage



body, a spiral spring is enclosed in a cylinder, a bolt having a large shoulder passing through the spring, the shoulder resting upon the latter, and the upper end of the bolt carrying an antifriction roller. The spring acts through the bolt, and its antifriction roller upon an inverted double inclined plane secured to the bottom of the carriage body, the apex of the inclined plane being "placed transversely in the centre of the car body, in a line perpendicular to the bolt, when the truck to which it is attached is square with the body of the carriage upon a straight track."

[*Printed, 10d. Drawing.*]

A.D. 1860, November 29.—No. 2932.

OFFORD, ROBERT, junior.—India-rubber tires. Two kinds of rubber are used in combination, vulcanite and that which is vulcanized but softer. According to the inventor, "the mode of fixing (for wood wheels) is to ring the metal with an iron tyre shrunk on, which iron tyre should be as light as possible consistent with the strength required for drawing the different parts together. When the india-rubber is in one continuous piece, the outer surface of this iron tyre and the inner surface of the hard rubber should be accurately fitted so as to drive on pretty tight, and it is then secured in place by a sufficient number of bolts or rings, the bolt heads being inserted through the outer or elastic surface, and screwed or rivetted on the inside of the felloe.

"Another method which I adopt in some cases is to secure the requisite number of nuts into the hard material before vulcanising, and to provide screws at proper intervals from the inner side of the felloe either into the said nuts, or if the nuts are dispensed with into the hard material itself. The above description relates to carriage wheels as ordinarily made with wood felloes, spoke, stock, and iron bush or box. Another mode is to make the wheel wholly of metal. The outer rim and spokes being wrought, and the centre box of cast iron or gun metal, or for smaller wheels certain parts may be of brass, and in these cases I should prefer to vulcanize such tyres at once on to the wheel itself, using metal bolts or projections when necessary to render the fixing additionally secure. Another application of the said im-

“ proved tyres is for covering cast-iron truck wheels of various  
“ sizes by vulcanizing the india-rubber tyre at once on to the  
“ wheel itself. The hard rubber or vulcanite forms the first  
“ covering next to the iron; this will take firm hold of the  
“ metal surface, but when practicable I prefer a groove or rib  
“ in the casting as an additional security. The elastic or  
“ outer surface is then added, and by its chemical adhesion  
“ during the process of vulcanising, forms a durable and  
“ elastic noiseless wheel tyre.”

[*Printed, 7d. Drawing.*]

A.D. 1860, November 30.—No. 2940.

PARSONS, GEORGE.—Wheels. This invention relates to improvements upon that protected by prior letters patent dated 3rd September 1859, No. 2018. “First, then,” says the inventor, “instead of casting a ring on the outer ends of the  
“ spokes, I connect the outer ends of the spokes to the felloe  
“ by means of shoes made of cast or wrought metal, and  
“ formed with a socket at front and back to fit the inside of  
“ the felloe, and with overhanging sides between which the  
“ felloe is placed. The outer ends of the spokes may be  
“ threaded, and the inside of the sockets correspondingly  
“ threaded, and the parts may be united by screwing. The  
“ threaded ends of the spokes may terminate in the shoe, or  
“ they may be extended through the shoe and felloe, and may  
“ be secured by a countersunk nut; or the outer ends of the  
“ spokes may be fixed in the sockets of the shoes by welding  
“ or by casting or otherwise. If found necessary, the shoes  
“ may be secured in their positions on the felloe by screws,  
“ bolts, or rivets; but I have found that shrinking of the tyre  
“ on the wooden felloe in the ordinary manner is sufficient to  
“ retain the shoes in their places. I prefer that the nave be of  
“ the construction described in the specification of my patent  
“ before referred to and that the spokes, when of wrought  
“ metal, be affixed thereto in manner therein set forth, but  
“ the nave may be otherwise constructed, and the spokes may  
“ be of wood; in such case, the ‘shoes’ herein-before mentioned for the reception of the outer ends of the spokes  
“ must have the inside of the sockets shaped and formed to  
“ correspond to the form of the outer ends of the spokes, so  
“ that they may fit into the sockets.

“ Another improvement consists in constructing ‘ caps ’ for  
“ metal and wooden naves for wheels of a disc of wood, cork,  
“ or other like material elastic in itself, or made sufficiently  
“ elastic by being surrounded by elastic material, and covered  
“ or not with a metal disc. This improved cap is driven into  
“ the aperture in the nave so as to lie flush or nearly so with  
“ the edge of the nose, and may be retained if necessary by a  
“ pin. When a linch pin is used, I make an aperture in the  
“ ‘ nose ’ of the nave for inserting and withdrawing the said  
“ pin, and close it by a wooden or cork plug, such as before  
“ described, for forming the improved cap.”

[*Printed, 7d. Drawing.*]

A.D. 1860, December 1.—No. 2946.

GREAVES, HUGH.—Carriages for tramways, &c. The improvements relating to the above consist in applying, in addition to the ordinary wheels, two or more guide wheels of suitable form, and mounted in suitable frames, and so connected to the body of the vehicle that by “ simply depressing  
“ or raising them the vehicle may be at pleasure confined to  
“ and guided by the rail of fixed gauge, or may be at liberty  
“ to leave the track for the purpose of passing other vehicles,  
“ or otherwise, which arrangement admits of such vehicles  
“ being employed for the double purpose of rail and road  
“ traffic when desired.” In carrying out this part of the invention the wheels are formed double, each wheel consisting in reality of two separate discs fixed upon the axle a short distance apart, and the guide wheels are placed between them, the bearings of the latter being capable of rising and descending, and the latter being either depressed so as to enter grooves in the rails on which the vehicle may be travelling, or being raised therefrom by levers actuated by the hand of the conductor, or rising and falling without such manipulation as the vehicle is brought upon the grooved rails or upon a level surface respectively. To the fore part of the vehicle bars or scrapers or revolving brushes are attached, for the purpose of removing stones or other obstructions from the rails.

[*Printed, 7d. Drawing.*]

A.D. 1860, December 10.—No. 3022.

PEAKE, THOMAS.—Skid. “The principal features of novelty in this invention consist in connecting the shoe or skid with a system of rods and levers extending therefrom to the seat of the driver, or other suitable part of the vehicle conveniently placed for the driver to operate upon, that is to say, in a line with the axle of the wheels of the vehicle, and in a horizontal line with the centre of the axle, and between the wheels thereon. I connect to the under part or body of the vehicle a cross axle or spindle capable of revolving in bearings; upon one end of said cross axle or spindle I securely fix a lever made with two arms similar to the letter **V** inverted; the extremities of these arms I connect by bolts and nuts to the side of the shoe or skid. I also affix to or form on the boss of this **V**-shaped lever a short lever, and connect same by a rod to another lever, the handle or upper end whereof extends to the driver’s seat, and on that side thereof most convenient to him. The lower end of this lever is connected by a pin to the body of the vehicle; by pushing this lever from him, or pulling it to him, as the case may be, the shoe or ‘skid’ will thus be brought under the wheel, the chain of the shoe or ‘skid’ taking the entire strain thereon.”

[*Printed, 10d. Drawing.*]

A.D. 1860, December 14.—No. 3074.

FENTON, JAMES.—(*Provisional protection only.*)—Securing tires. The following is the inventor’s provisional specification:—

“My invention is intended to apply chiefly to railway wheel tyres, and consists in hollowing out or cutting away a portion from the inner side of the inner tyre, sole, or felloe, and on the outer edge of the wheel, the line left by the removal of a part of such portion being parallel with the edge of the inner tyre or felloe, and a part inclined, or the whole may be inclined. I then form the outer edge of the wearing tyre to overhang and fit under the outer edge of the inner tyre or felloe, and at intervals I indent and set up into the part removed from the inner tyre or felloe as before mentioned, the overlapping part of the outer tyre.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, December 17.—No. 3091.

STOCKER, ALEXANDER SOUTHWOOD.—“Improvements in the  
“ manufacture of tyres for wheels.”

This invention relates to the manufacture of tyres “to be  
“ applied to wooden wheels running on common or other  
“ roads,” and it consists “in the employment for that pur-  
“ pose of two differently constituted metals in order to pro-  
“ duce the bars out of which the tyres are intended to be  
“ made; also in bending and welding such bars into wheel  
“ tyres; also in drilling or punching holes through tyres,”  
when made in accordance with this invention, such holes being  
meant to receive the bolts, nails, rivets, or screws by which  
such tyres are to be affixed to the wheels.

The patentee uses ordinary wrought iron in combination  
with the metal commercially known as steel iron or puddled  
steel, “placed together in any desirable proportions, and dis-  
“ posed in any convenient manner,” the harder material  
being intended for the wearing side of the tyres, and the  
softer one being the foundation upon which the harder one  
rests, in order to avoid breakage. Bars of the two metals  
having been placed together “in a pile convenient for the  
“ purpose intended,” are then heated and welded together  
by being passed and repassed through rolls, ‘this operation  
“ bringing out a bar united firmly in one solid mass, and of  
“ the suitable shape and dimensions for the tyres intended to  
“ be produced” thereupon, and which tyres are “bent,  
“ welded, holed, shrunk, rivetted, screwed, or otherwise  
“ fastened on the wheels in the ordinary manner.”

The patentee mentions that a compound of 60 per cent. of  
the hard and 40 per cent. of the softer metal is “most desir-  
“ able” for the purpose of the invention, and that tyres formed  
from such a compound are much stronger and more durable  
than the tyres in common use, “especially under heavy  
“ weights, hard wear, and usage.” He also mentions that  
tyres “may be made out of the hard metal in its entirety,  
“ although it is not desirable to do so.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, December 22.—No. 3147.

HUGHES, HENRY.—(*Provisional protection only.*) — Wheels.  
This invention consists, firstly, in “the introduction of

“ wrought or cast iron tubes, whether taper or cylindrical,  
 “ rectangular, or oval section, instead of the usual wooden  
 “ spokes, on which there is cast an ordinary cast-iron nathe  
 “ of suitable shape. The spokes are laid in a template made  
 “ in two parts, so that it is impossible to move them from  
 “ their position. A mould is then made of the nathe in sand  
 “ and the template and spokes so laid that the ends of the  
 “ spokes are in the mould when the metal is run round them.  
 “ After the nathe has been cast on the wood, felloes are at-  
 “ tached in the usual manner, and a tyre shrunk on the whole,  
 “ or a tyre may be fastened on without the felloes.”

The inventor further claims a method of “ forming a wheel  
 “ of bent spokes of wrought iron by rivetting or bolting this  
 “ form of spoke to the inside of felloes or a ring of wood, and  
 “ then casting on the spokes a nathe similar to that before  
 “ described for the tubular spokes after which the tyre is  
 “ shrunk on in the ordinary manner.”

[*Printed, 5d. Drawing.*]

A.D. 1860, December 27.—No. 3170.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from  
 Pierre Joseph Bertrand.*)—(*Provisional protection only.*)—“ Im-  
 “ provements in axle-boxes, and in naves of wheels.”

This invention consists “ in connecting the axle boxes to  
 “ the axles, and the naves to the boxes, by means of locks  
 “ forming bayonet joints, in such manner that these parts are  
 “ independent of each other. The axles are formed at each end  
 “ with cylindrical heads, which are received in the inner ends  
 “ of the axle boxes, where they are retained by a collar, the  
 “ circular opening in the face of which is of less diameter  
 “ than the cylindrical head.”

“ The collar has portions cut away which fit over projections  
 “ on the outer surface on the axle-box, so contrived that on  
 “ the collar being placed on the box and partially turned a  
 “ bayonet joint is formed; keys to keep the joint secure are  
 “ afterwards employed. The nave is formed of a ring of iron  
 “ or other suitable material with a side rising at right angles  
 “ or nearly so therefrom, and with ribs so formed as to leave  
 “ a trapezoidal-shaped space between every two for the  
 “ reception of the inner ends of the spokes. A face plate to

“ form the other side of the nave is then applied, and is  
 “ secured by screws or bolts and nuts ; projections are formed  
 “ on the outside of the box, and apertures are made on the  
 “ inner face of the nave ring in such manner that on the nave  
 “ ring being pushed over the projections and partially turned  
 “ a bayonet joint is formed which is afterwards secured by  
 “ keys or wedges.”

[*Printed, 3d. No Drawings.*]

## 1861.

A.D. 1861, January 1.—No. 3.

HENRY, MICHAEL.—(*A communication from Philippe Louis Aimé Stilmant and Louis Anne Felix Allain.*)—Brake.

“ This invention consists of a break, in which a wedge  
 “ block or variously shaped moveable piece is brought  
 “ between a wheel pulley or revolving object to be stopped or  
 “ retarded, and an inclined plate, plane, or surface on a bar,  
 “ rod, shaft, bearer, arm, or equivalent, and thereby effects  
 “ the required retarding or stopping action. The break may  
 “ be applied so as to act against the ordinary or bearing  
 “ wheels of the carriage, or on a wheel keyed on the axle or  
 “ on the revolving part or object desired. The block or  
 “ ‘break piece’ may be readily actuated or controlled by  
 “ appliances suitable for bringing it into the required position  
 “ between the inclined surface and the revolving wheel or  
 “ object where it pushes in and bears, presses, or acts to the  
 “ desired extent to effect the required stopping or retarding  
 “ action.”

[*Printed, 7d. Drawing.*]

A.D. 1861, January 2.—No. 7.

JOHNSON, DANIEL ALLEY.—(*A communication from F. M. Gibson.*)—Joining wooden felloes and spokes. Two methods of effecting the above are thus described by the patentee :—  
 “ First, I take the felloes or segments of which the wheel  
 “ is to be composed, and scarf all their ends, I then face these

“ ends into a series of metallic boxes, shoes, or seats. These  
 “ shoes or seats have a socket cast or formed on them for the  
 “ purpose ” of “ receiving the end of the spoke ; the interior  
 “ of this socket is conical, tapering upwards, thus bringing  
 “ the rim almost to an edge, and obviating any tendency of  
 “ the wood to splinter, as would be the case if a shoulder  
 “ were made on it, I insert the spoke in the usual way in the  
 “ nave, then pass it through the socket, and the lower scarf  
 “ of the felloe until it meets the upper scarf, thus allowing  
 “ the wheel to settle together when in use.

The second method of effecting the same object is as follows:—In this case “ I slightly alter the form of the shoe or  
 “ seat. The spokes are inserted in the box, and terminate  
 “ there, through the centre of this shoe, box, or seat is a hole  
 “ wider at both extremities than at the centre, the end of the  
 “ spoke is made to fit the lower part of the aperture and when  
 “ passed through, a wedge is driven into the end of the spoke  
 “ and causes it to expand, makes it fit tightly, the upper  
 “ portion of the aperture, only the end of the wedge touches  
 “ the inner surface of the tire so as the wheel settles together  
 “ it only causes the spoke to fit more firmly and exactly the  
 “ hole in the shoe or seat. The object attained by thus  
 “ locating the spokes over the joints of the felloes is to prevent the injurious effects of the vibration and sudden shocks  
 “ to which the wheel is subject to, during severe or long  
 “ continued use.”

[*Printed, 5d. Drawing.*]

A.D. 1861, January 4.—No. 24.

COCKER, JAMES.—(*Provisional protection only.*)—Passenger counter. The invention “ As applied to omnibuses, consists  
 “ of a light oblong frame, suspended in the doorway or  
 “ passages on swivels, hinges, pivots and centres, or other  
 “ mechanical connections fastened to both sides or cheeks of  
 “ the doorway or to pillars and brackets erected or fastened  
 “ at the entrances. On and through the said swivels, hinges,  
 “ pivots, and centres, or other mechanical connections, the  
 “ said oblong frame is free to rotate and slide so that when  
 “ the lowermost side or part is raised, say, forwards and  
 “ upwards, and over the centre of gravitation, it will slide



“downwards and assume apparently the same position for the next movement, the difference being that the former uppermost part of the frame will now be at the bottom and vice versa, the various movements are communicated by catches and other suitable apparatus to a consecutive or other registering machine, and the arrangement as a whole serves as a self-acting check on guards in charge of vehicles.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 11.—No. 79.

CHELLINGWORTH, THOMAS TERTIUS, and THURLOW, JONATHAN.—(*Letters Patent void for want of Final Specification.*)

Traction engines. The boiler is mounted upon trunnions and fitted with gearing by means of which its front end may be raised and depressed, in order to greserve a proper water level on inclines. The gearing is worked from the engine and a pendant weighted lever, automatically controls it.

A superheater is fitted within the smoke box.

The safety valves blow off into the water tank.

The steering is effected by means of “a segmental rack having worm teeth thereon and worked by a worm wheel.”

The framing of the engine is so constructed as to provide for outside as well as inside bearings.

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 15.—No. 118.

NEWTON, ALFRED VINCENT.—(*A communication from Samuel J. Seely.*)—“Improvements in the construction of railway and other carriages.”

This invention consists “in constructing the bodies of railway carriages and other vehicles of corrugated metal plates, properly braced and secured together in such a manner as to secure a greater degree of strength to bear weight and resist pressure than has heretofore been attained with the same weight of metal.”

The corrugations “may be larger or smaller according to the size of the carriage, the principal thing to be observed in their formation being that their bends should not be so acute as to impair the natural strength of the metal.” Strong pieces of angle iron may be used to form the base and

corners of the carriage, the corrugated plates being rivetted to them, and the door casings may be formed of continuous pieces of metal, bent as requisite. At the bottom of the carriage are "trough beams," and to these the journal box pedestals are rivetted.

For large railway carriages two or three layers of corrugated plates are connected together by rivetting, the plates being so arranged that the corrugations of one may cross those of that placed against it, a structure of great strength being thus obtained. In order to obtain a smooth interior surface to a carriage plain plates of metal may be rivetted to the corrugated plates; or such plates may be furnished with designs to render them ornamental, and spaces between these and the corrugated plates, or between the corrugated plates themselves may be rendered available for both ventilating the carriage in hot or supplying it with heated air in cold weather.

For railway carriages intended for pleasure or for use in tropical climates "side wings" may be applied these being jointed to the sides or cornice of the roof, and so arranged as to be placed at any desired angle in order to shield the passengers from the rays of the sun, and turned over upon the roof when not required for that purpose.

[*Printed, 9d. Drawings.*]

A.D. 1861, January 15.—No. 119.

BIGELOW, LUCIUS AURELIUS.—(*A communication from Joseph Harris, junior.*)—(*Provisional protection only.*)—Tramway cars and omnibuses. Doors are placed at both ends of the vehicle "but instead of these doors being in the middle or equidistant from the sides as they usually are, they are placed at the rear side corners of the vehicle. The traction appendages of the vehicle are so arranged that they may be adapted to either end, and therefore the door at the hinder end of the vehicle will always be so situated that it may be brought close up to the side walk for the convenience of passengers getting in or out. The opening and closing of the doors is placed under the control of the driver by means of a spring, catch, or bolt, or other contrivance, that may be worked by a strap or cord by the driver. The passengers will pay their fare to the driver on entering the vehicle or soon after,

“ and when they desire to descend they will notify the driver  
“ of their intention, that he may release the door by means  
“ of the cord or strap.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 17.—No. 137.

HENRY, MICHAEL.—(*A communication from José Gallegos.*)—  
Apparatus for locomotion. “This invention first relates to  
“ improvements in apparatus for locomotion. By means of  
“ these arrangements power imparted or acquired for the  
“ purpose of locomotion may be communicated from one  
“ point to another in such manner as to increase speed to  
“ compensate for loss of power, or vice versâ, or to guide or  
“ impart or vary the direction of motion, as required.

“The means employed for obtaining and controlling or  
“ regulating the locomotion of the carriage or such like struc-  
“ ture in the desired manner include, first, constructing  
“ apparatus in such manner as to apply the muscular power  
“ of the limbs of a man, acting as a motor, for guiding or  
“ steering, backing, and stopping the carriage or vehicle, and  
“ causing it to surmount obstructions presented to its passage  
“ and to travel over inclines.

“Secondly, employing the weight of a man acting both as  
“ motor and conductor by placing him in a vertical position  
“ sufficiently unsteady for his weight to oscillate from side  
“ to side, and produce propulsive power applicable to treadles,  
“ pedals, or levers, so contrived as to transmit motion to  
“ gearing or connections, whereby power and speed may be  
“ increased or reduced.

“Thirdly, the weight of a man on a seat placed on the top  
“ of a sort of triangular piece, reversed pendulum, or rocking  
“ appliance, oscillating or rocking on a centre or axis, such  
“ weight being applied or falling on suitable treadles or  
“ levers.

“Fourthly, constructing arrangement whereby a man  
“ acting as a motor may bear vertically and alternately on  
“ two treadles or levers, wherefrom the power of the weight  
“ is transmitted to drums which communicate it to strong  
“ springs, wherein the power is accumulated in order to be  
“ delivered therefrom.

“Fifthly, obtaining power by the mutual oscillation, action, and reaction of mercury produced by throwing it out of level, such mercury being held in and combined with receivers and apparatus for transmitting power to which a man imparts the requisite impulsions.” The patentee sometimes employs as his “propulsive agent to be applied with these improved arrangements, a compressed air or a caloric engine, such as Ericson’s, or air expanded by electricity (as Lenoir’s plan).”

The gearing may be combined with endless bands or chains to reduce space and weight.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1861, January 19.—No. 153.

RICKARDS, JAMES BATESON.—(*A communication from Charles Jean de Mat.*)—(*Provisional protection only.*)—Axle and axle box. “This invention consists in adapting to the nave of a wheel a casting or a box passed through a hole in said nave, and also in adapting to the journal of the axle spheres of metal held in position between two grooved rings of metal fixed at some distance asunder within the aforesaid box and two corresponding grooved channels made in two collars formed upon the journal of the axle. The aforesaid spheres, which may be of small diameter, are held equidistant from each other around the axle and within the box by adapting other smaller spheres of metal between each of the larger spheres; by these means it is the larger spheres only that are in contact with the journal, and thus the friction on said journal is considerably diminished.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 21.—No. 165.

STEWART, THOMAS.—(*Provisional protection only.*)—Hansom cabs. The following is the inventor’s provisional specification:—

“My invention of improvements in hansom cabs relates, first, to forming the front of such vehicles above the level of the doors of a semicircular form, and enclosing the same with sliding and fixed sashes or glasses; and, secondly,

“ to the application of wings to such cabs to protect persons  
“ from the wheels on entering and alighting, and to prevent  
“ the dirt being thrown in the forward direction. The doors  
“ of these cabs I make to open much in the ordinary way,  
“ and on the upper part form (or mount a piece carrying) the  
“ grooves for the sliding glasses. I enclose the space above  
“ the fixed part of the front at the sides of the doors by fixed  
“ curved glasses, a standard being carried up from imme-  
“ diately over the hinges to the roof; to form the frame  
“ inside of these fixed glasses I form the continuation of the  
“ grooves to carry the sliding glasses before mentioned.  
“ These sliding glasses I suspend at top from a curved rail  
“ running round the front, on which rail the sliding glasses  
“ traverse on wheels or otherwise. These glasses being por-  
“ tions of a circle slide readily, and if it is desired to have the  
“ front open with the lower doors closed, they are allowed to  
“ remain behind the fixed curved glasses forming the fixed  
“ part of the front; on the other hand, when the occupant  
“ desires them closed he has simply to slide one from each  
“ side so as to meet in the middle, where they may be fastened  
“ by a hook or otherwise. The cab may also have side lights  
“ in the panels as usual, but which I prefer to fit so as to  
“ slide and open for ventilation. The wings I either fix into  
“ the ends of the springs or in the shackles or scroll irons, or  
“ they may be mounted on the body of the cab.”

*[Printed, 3d. No Drawings.]*

A.D. 1861, January 22.—No. 176.

HOLMES, ARTHUR EAST.—Springs. This invention “ con-  
“ sists in connecting the plates forming the ellipsis at one or  
“ both ends through a bow or bows and loop or loops.”  
“ The bows may be formed of several plates of metal or of  
“ one thickness of wrought metal only, or the bows may be  
“ in the form of a ring crossing the ends of the ellipsis trans-  
“ versely, while the connecting loops or links may be made of  
“ leather, caoutchouc, webbing, or other like suitable material,  
“ strengthened or not with metal.”

*[Printed, 6d. Drawing.]*

A.D. 1861, January 22.—No. 177.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from the Société des Forges of Montataire.*)—(*Provisional protection only.*)—Manufacturing tires. “This invention consists in forming  
“a faggot built up of bars of iron in layers, the bars in  
“every successive layer crossing those in the preceding  
“layer, and in treating faggots thus prepared, as here-  
“after explained, to form tyres, hoops, and rings without a  
“weld or joint round the circumference thereof. The faggots  
“are by preference so built as to be of an octagonal shape in  
“plan, for which purpose bars of different length must be  
“used. The faggot is brought to a welding heat, and welded  
“into a solid mass under a steam hammer by the aid of dies  
“and tools, which then, and by preference at the same heat,  
“round the block, and punch a hole through the centre.  
“The punching tool drives the greater part of the metal into  
“the thickness of the block, and removes only a small portion.  
“The block is thus made circular with a hole through the  
“centre. It is again heated, and is placed on a shaft having  
“two different diameters, and is there subjected to the blows  
“of a steam hammer carrying on its face a die formed to  
“give the shape necessary for the outer surface of the tyre,  
“hoop, or ring in course of manufacture. The ring becomes  
“expanded, and when sufficiently the shaft carrying it is  
“driven forward, and the ring is shifted on to its larger  
“diameter. The blows of the hammer are repeated until the  
“ring or tyre has been sufficiently beaten out, when it is  
“removed from the shaft, and may be finished by rolls or  
“otherwise in the ordinary manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 24.—No. 191.

THOMAS, REBECCA.—(*Provisional protection only.*)—Securing tires. The following is the inventor's provisional specification:—

“This invention has for its object the securing of tires  
“on wheels more effectually than heretofore, so that in the  
“event of the tire breaking it will nevertheless remain  
“attached to the felloe of the wheel. The following is an  
“example of the means by which I propose to effect the

“ object of this invention, that is to say, I form the tire of  
“ the wheel with lugs or projections on the edges thereof at  
“ certain distances apart, the lugs on one edge coming oppo-  
“ site to the spaces between the lugs on the other edge.  
“ These lugs are intended to embrace the felloe of the wheel,  
“ and may be connected thereto by screws passed through  
“ said lugs, or by bolts and nuts, or the said screws or bolts  
“ may pass through the tire and felloe, or be secured to the  
“ tire and wheel in any other convenient and suitable  
“ manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, January 25.—No. 202.

NEEDHAM, SAMUEL.—Spring seats, &c. Instead of placing spiral springs in the stuffing of seats, the patentee fits steel spring bands, slightly arched, to the framing itself. The seat rests on the top of these springs which are properly tied together. In some case double springs may be used.

[*Printed, 10d. Drawings.*]

A.D. 1861, February 4.—No. 292.

MORGAN, EDWARD CHARLES.—(*Provisional protection only.*)—Preventing vibration in carriages. In constructing carriages, the inventor employs two or more thicknesses of wood cemented together. “ Each of such thicknesses or layers of  
“ wood is perforated with numerous holes, and in joining or  
“ cementing them together it is preferred they should be so  
“ arranged that the perforations or holes shall not come  
“ opposite each other, and between such layers or thicknesses  
“ of wood ” he interposes a “ layer or thickness of leather or  
“ of felt, or other fabric or soft substance suitable for damp-  
“ ing or preventing sound ; and in some cases such leather,  
“ felt, or other soft substance may be also applied on the  
“ exterior and interior of such combinations of wood and  
“ other materials.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, February 6.—No. 306.

GEE, THOMAS.—Composition for carriage panels, &c. Refuse leather, after having been cleansed and disintegrated, is mixed

with fibre, metal filings and mucilage or gluten or oils or gums and then pressed or moulded into the required shapes.

[*Printed, 4d. No Drawings.*]

A.D. 1861, February 11.—No. 345.

JOHNSON, JOHN HENRY. — (*A communication from Jose Gallegos.*)—Axlebox. According to this invention “it is proposed to employ a number of antifriction rollers, which are fitted loosely on to separate and independent axes of their own, and so disposed inside the grease box as to leave a space in the centre of them, into which space the main journal of the shaft or axle is introduced, resting upon the peripheries of the lower antifriction rollers of the circular series. The grease box is packed so as to be grease-tight, and is kept always full of oil or other suitable lubricant, so that the rubbing surfaces are constantly immersed in lubricating material. Openings may be made in and through the antifriction rollers, so as to allow the oil to circulate freely all round. These rollers, which it is preferred to make of steel, may, if desired, be made so as to bear upon the journal at their extremities only, the centre or middle portion being of a slightly reduced diameter; and in order to lower the cost, the ends or working parts only may be of steel, whilst the central portion is of cast iron, with suitable apertures, and the three parts are bolted together by longitudinal bolts so as to form one roller. In the case of wheels which turn loosely upon their axes, the same arrangement of rollers may be applied to the naves or bosses of such wheels, in which case they will revolve round the axle journal as well as rotate on their own individual axes. Suitable provision is made for inspecting the state of the oil supply by having small glass-covered apertures in the oil chambers, and this applies equally to the fixed bearings for rotating shafts to the boxes of wheels running loose on stationary shafts or axles.”

[*Printed, 7d. Drawing.*]

A.D. 1861, February 14.—No. 377.

DEVLAN, PATRICK SARSFIELD.—Axle bearing. This invention consists “in the use and application of the pulp employed



“ for making paper for boxes and bearings of journals, as a  
“ substitute for the various metals, alloys, and compositions  
“ used for such purposes. It may be used alone, or mixed  
“ in combination with plumbago, plumbaginous substance,  
“ plaster, or other suitable material, by means of gum  
“ shellac, or other gum, and moulded when wet into form by  
“ pressing it into the stands, or iron boxes, or other con-  
“ venient way, as in casting Babbit metal boxes, and allowed  
“ to dry.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, February 15.—No. 382.

POULSON, EBENEZER.—(*Provisional protection only.*)—Propelling carriages, &c. “The drawback to the present  
“ velocipedes” says the inventor “is a want of sufficient  
“ power; I now overcome the present difficulty by giving a  
“ much greater power by employing two levers, one on each  
“ side of the velocipede, with a connecting rod from each  
“ lever, and those levers attached to two cranks fixed on the  
“ main axle or shaft of the driving wheel, and these cranks  
“ are fixed at right angles, thereby giving a continuous and  
“ greater power to be worked from the end of the lever,  
“ either by manual labor or by steam. This invention may  
“ be applied to all kinds of carriages, barges, and boats.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, February 18.—No. 397.

OFFORD, ROBERT, junior.—Preventing concussion in vehicles. The patentee thus describes his improvements:—“The  
“ windows I make with improved noiseless and durable  
“ frames for the glasses of the material known as ‘hard’  
“ india-rubber, chemically united where desired with the soft  
“ or elastic india-rubber or material to prevent rattling and  
“ noise, the glasses to be secured in grooves prepared for  
“ that purpose. I have also an improved isolating block for  
“ carriages which I purpose to make of two or more pieces of  
“ the ‘hard’ and ‘soft’ india-rubber or material chemi-  
“ cally united in one, so as to connect the spring to the axle  
“ or the body to the spring by means of the said block, and

“ thus diminish the vibration caused by metallic connection.”

“ For the wheels and axles of carriages I use an improved washer. This is formed by uniting a thin disc of the elastic material chemically united to one or more discs of hard, so as to give a suitable wearing surface with slight elasticity when the wheel is screwed up to its place.

“ To obviate the drumming noise and vibration so often complained of in a close carriage I purpose to use for parts of the roof, pannels, and other portions of close carriages, in lieu of wood sheets of hard and soft india-rubber united and arranged in such a manner as to deaden the aforesaid sound and vibration, or to suitably secure to the present woodwork pieces of this compound so as to produce the same effect. The step cover for carriages I purpose to make of india-rubber moulded into the requisite shape, and vulcanised hard.”

[*Printed, 7d. Drawing.*]

A.D. 1861, February 20.—No. 422.

PARSONS, GEORGE.—Wheels. These improvements consist, firstly, in a “new construction of nave formed of a ring or rings, into which the ends of the spokes are secured. If wrought metal rings are used, the spokes are rivetted, screwed, or welded. If the rings are of cast metal, the inner end of the spokes are cast into them. These rings or naves are fitted or shrunk on to a metal box, by preference of cast iron, brass, or gun metal.”

Secondly, “in making the spokes of wrought iron or steel to taper from the nave to the outer end.”

Thirdly, “in the means of connecting or securing the outer ends of the spokes to the wooden felloe, as hereafter described.” The patentee fixes “bosses or nuts on to the spokes at or within a few inches of their outer ends, either by welding, screwing, or rivetting. When by screwing the ends of the spokes are threaded and the nuts or bosses tapped. When these parts are not secured by screwing they are united “by welding or by any other known means of uniting metals.” It is preferred “to form the bosses or nuts broader at their outer than at their inner ends, to

“ secure a large bearing surface for the inside of the felloes  
“ to rest on. The felloes are fixed or fitted on the bosses or  
“ nuts, and, by preference, the ends of the spokes are made  
“ to pass into or even through the felloes ; when through them  
“ they may be further secured by nuts or by rivetting. Or  
“ the ends of the spokes may be secured to the inside of the  
“ felloe by forming a double or single flange, which flange is  
“ fastened to the felloes by screws, bolts, rivets, or other  
“ suitable means.”

Fourthly, the invention consists “ in the employment in  
“ wheels formed with wooden felloes of a disc or discs of  
“ metal instead of spokes ; these discs are secured to the nave  
“ and to the felloe.”

To complete the wheels the patentee applies “ outside of  
“ the felloe a band or tyre (by preference hot) or segments,  
“ or ‘ streaks ’ may be applied instead of the band or tyre,  
“ and may be secured to the felloe by bolts, screws, rivets or  
“ nails, as is usually done.”

[*Printed, 7d. Drawing.*]

A.D. 1861, February 21.—No. 431.

LONGSHAW, JOHN.—(*Provisional protection only.*)—Brakes. This improvement consists “ in applying breaks to wheels at  
“ a point directly vertical above the axle, or nearly so, in  
“ contradistinction to any other portion or part of the wheel,  
“ by which improvement a greater holding or ‘ break ’ power  
“ may be exerted upon the wheel than hitherto, and by any  
“ ordinary and well known appliances of leverage or screw  
“ power without injury to the axles, bearings, and other parts  
“ of the carriage. The pressure and strain exerted by the  
“ break in the improved position being directly vertical from  
“ the break and its applied power to the ground or rail,  
“ instead of being exerted in a horizontal direction, in which  
“ latter instance considerable pressure of the ‘ break power ’  
“ is injuriously exerted upon the axle at its bearings.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, February 21.—No. 435.

EVANS, DANIEL.—Wheels. This invention relates to improvements in the construction of wheels, having especial

regard to the fastening of the tires. The tire "is rolled or  
 " formed with an interior rib or projection, the sides of  
 " which are made to incline to the inner surface of the tyre  
 " so as to form a dovetail section or other section of such  
 " like form as will prevent the projecting rib passing outwards  
 " from between two surfaces, one on either side, which com-  
 " bine the tyre with the nave. These two sides consist of  
 " two circular plates or discs formed with flanges at their  
 " outer edges which project inwards, the edges of such flanges  
 " being formed to correspond with the sides of the inner rib  
 " or projection on the tyre so that when the two side plates  
 " are fixed in their places no part of the tyre, though broken  
 " into many pieces, will be able to get away or be thrown off  
 " from the side plates. The nave" is preferred to "consist  
 " of an inner cylinder of somewhat larger diameter than the  
 " central holes or openings through the side discs or plates  
 " and such cylinder is extended at each end, but of less  
 " diameter, so as to pass through and fit the central openings  
 " in the two side plates or discs, and provision is made for  
 " fixing plates or washers on the ends of the cylindrical nave  
 " outside of the side plates or discs." It is preferred that  
 " the two side discs or plates should be parallel to each other  
 " and vertical. The two side plates or discs may be fixed  
 " together, and to the tyre by bolts passing through them,  
 " and upset or rivetted at their ends or otherwise fixed."

[*Printed, 10d. Drawing.*]

A.D. 1861, February 22.—No. 442.

**MANNIX, JAMES BALL.**—(*Provisional protection only.*)—Applying springs. The inventor says "instead of applying springs  
 " to carriages as at present, whereby any elevation of the  
 " axles caused by the inequalities of or obstacles on the  
 " ground over which they roll is directly transmitted to  
 " the bodies of the same, I propose to so apply springs so as  
 " to obviate that defect by employing bars or levers so placed  
 " and in such manner as that certain ends of the same, to  
 " which the bodies will be connected, shall remain nearly  
 " motionless in a vertical direction by reason of the unequal  
 " amounts of vertical displacement of the axles and of those  
 " parts of the springs to which these bars or levers will be  
 " attached. Of these bars or levers one end I propose to

“ suitably attach to the axles, or to rigid pieces connected  
“ with the axles, and the ends to suitably connect with the  
“ bodies, or with the under carriages, or with the cross  
“ springs or other side springs, should such be used ad-  
“ ditionally, and to cause certain parts of these bars or levers  
“ intermediate between the ends to rest in a suitable manner  
“ on certain parts of the side springs, for example on the  
“ ends of the side springs when of the form of ordinary  
“ railway carriage springs.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, February 25.—No. 477.

HENSON, WILLIAM FREDERICK.—Springs. “ Springs that  
“ are constructed of a number of flat plates of steel lying one  
“ upon the other and connected together by means of studs  
“ on one plate passing into slots formed in the following  
“ one are apt to break and the pieces of plates falling  
“ out, the next plates lose their support and break likewise,  
“ and thus the whole spring is speedily destroyed.” The  
patentee therefore employs “ plates of steel of a groove  
“ shaped section, fitting one into the other instead of flat  
“ plates, thus greatly increasing the strength of the spring  
“ with the same amount of metal, and also preventing the  
“ possibility of pieces falling out, should one of the plates  
“ break.”

[*Printed, 6d. Drawing.*]

A.D. 1861, February 27.—No. 507.

WHITGROVE, JAMES TURNER.—(*Provisional protection only.*)  
—Funeral carriages. This invention relates to a hearse and  
mourning carriage in combination. “ The carriage is divided  
“ longitudinally by a central partition, against which the  
“ seats are arranged so that the inmates of the carriage sit  
“ in two rows back to back with their faces towards the  
“ windows at the sides of the carriage. The compartment  
“ to receive the coffin is made under the seats, and access  
“ is obtained thereto by means of a door at the back or  
“ end of the carriage. The carriage may be made to hold  
“ four, five, or six on each side, and access is provided on  
“ each side by means of doors between the wheels. If

“ desired, a passage may be made round the front end of  
 “ the carriage, so that all the mourners may descend at  
 “ either side. When this is the case, some of the mourners  
 “ may be arranged to sit back to back with their faces  
 “ towards the side windows, as in the former instance, and  
 “ others of them may sit with their faces towards the front.  
 “ By this arrangement, the compartment under the seat to  
 “ receive the coffin will necessarily be somewhat shortened,  
 “ but when the carriage is made to hold eight or more people,  
 “ there will still be sufficient room for coffins of ordinary  
 “ dimensions.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 7.—No. 582.

EDWARDS, JOHN. — (*Provisional protection only.*)—Joining felloes. These improvements “ consist in connecting the ends  
 “ of the several parts or sections forming the felloe or rim of  
 “ a carriage wheel by means of metal couplings inserted in a  
 “ slot cut in the ends of each of the said sections, and further  
 “ in inserting the outer ends of the wheel spokes in the said  
 “ couplings instead of in holes drilled through the felloe, as  
 “ heretofore. The said felloe or rim is composed of as many  
 “ sections as there are spokes in the wheel, so that each  
 “ section being of a shorter length than in wheels as formerly  
 “ constructed, can be cut more in direction with the grain of  
 “ the wood.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 13.—No. 613.

SPENCER, GEORGE. — (*Provisional protection only.*)—India-rubber springs. The supporting plates in these springs are not allowed to project beyond the outside of the india-rubber, “ by which means the india-rubber preserves a more regular  
 “ outline and is less strained than when the plates project.” The plates may be of thin metal, or wire gauze, or be spirals of wire, or rings of metal. The inside supports are incorporated in course of manufacture.

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 14.—No. 636.

HODSON, WILLIAM.—(*Provisional protection not allowed.*)—Propelling and steering carriages, &c. The propulsion is effected by means of inclined pusher rods, the weight of the carriage by preference being carried by two wheels on spring axles. These pusher rods are carried by a frame pivotted to the carriage frame. Each of these passes through a cylinder attached to the swing frame. At their upper ends they are attached, by connecting rods, to a crank shaft and they have pistons on the parts within the cylinders. By these means the rods are caused to operate in turn. A similar apparatus, the inclination of the rods being reversed, is also fitted to the carriage to effect propulsion in an opposite direction.

The carriage is steered by preference through two locking wheels in front. They are controlled by a "horizontal bevilled" toothed wheel on the vertical axis on which the wheels "turn; into this wheel a bevil pinion works, and on the axis of this pinion are a number of radial footboards, in order that" the steering may be effected by the feet. "The carriage may also be steered by one wheel in the front turning upon a swivel, and having a cross bar upon the top with two rods leading from each end to the feet of the driver."

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 18.—No. 674.

KRUPP, ALFRED.—(*Provisional protection only.*)—Securing tires. According to this invention, as applied to the construction of new wheels, the inventor forms the rim of each wheel "with an angle piece projecting upwards on that side of the wheel of which the flange of the tyre is coincident. This angle piece is either rolled or turned out with a groove on the inside. The reverse side of the rim is turned or rolled, or otherwise formed with a bevil groove on the top or underside as preferred," and the angle piece is "bevilled or curved off" on its outer edge. The tyre "is rolled or otherwise formed of a somewhat reverse form on its under side to the section of the wheel rim, so that when the two come together the parts shall correspond. The face of the rim of the wheel is made slightly on the

“ incline towards the inner edge for the purpose of facilitating  
“ the putting on of the tyre,” the latter being “passed over  
“ the rim of the wheel in the cold or nearly cold state by  
“ hydraulic pressure in preference, though the tyre may  
“ be slightly warmed and dropped over the rim till the  
“ projection on the tyre comes in juxtaposition with the  
“ groove in the angle piece of the rim, and the completion  
“ of the putting on of the tyre is then done by hammering or  
“ by pressure.”

In order to adapt the invention to an old wheel such wheel must be first furnished with a “supplementary rim” of similar section to that described above; this supplementary rim being shrunk upon the “first or normal rim” of the wheel, and further secured if necessary by bolts, or by being grooved for the reception of the first or normal rim. The tyre in both these arrangements is secured upon the wheel by being hammered or pressed so as to form an overlap outside the angle piece first mentioned, thus partially embracing that portion thereof which is “bevilled or curved off.”

Different modes of carrying out the invention are described; in some cases the rim being formed without the angle piece, a ring being used instead, which extends both above and below one side of the rim, and having thereon one angle piece which fits into a groove in the tyre, and another which fits a groove on the under side of such rim.

One advantage arising from these arrangements is mentioned as consisting in the tyre being secured to the wheel without the necessity for using bolts or screws.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1861, March 18.—No. 675.

ARROWSMITH, JOHN.—(*Provisional protection only.*)—Window attachment. On the side of the window frame is fixed  
“ a strip of brass or iron in which a series of holes are made,  
“ the said series of holes extending from nearly the top to the  
“ bottom of the said frame at about two inches apart. In the  
“ part of the door in which the window slides is a small lever  
“ the upper end of which is pressed by a spring against the  
“ strip of brass or iron on the window frame. A thumb  
“ plate connected with the said lever enables the occupant



“ of the carriage to raise the end of the lever from the said  
 “ plate. In order to fix the window at the required height  
 “ the thumb-plate is pressed and the window raised to the  
 “ required position. By now liberating the thumb plate the  
 “ end of the lever is pressed into one of the holes in the brass  
 “ or iron plate on the window frame, and the window is  
 “ thereby fixed. By pressing the thumb plate the window  
 “ may be allowed to fall, but the sudden fall of the window is  
 “ in this case prevented by the lower end of the lever pressing  
 “ against the brass or iron plate in the window frame, the  
 “ same action of the thumb plate which liberates the upper  
 “ end of the lever causing the lower end to press upon the  
 “ plate. One of the said plates with holes may be fixed on  
 “ either side of the carriage window frame and a lever pro-  
 “ vided to engage in each of the said plates. The said levers  
 “ may be worked from one thumb plate fixed on an axis con-  
 “ necting the said levers.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 23.—No. 732.

CLARKE, WILLIAM HENRY.—(*Provisional protection only.*)—  
 Commissariat waggon. Part of this invention relates to  
 improvements in field cooking apparatus, but the invention  
 also relates to the means of conveyance of the apparatus and  
 stores. The “store caravans” are made “of a light lattice-  
 “ work of wire, wood, or other material, mounted on a  
 “ rectangular or other frame, of a size to enclose the desired  
 “ area. The lattice-work” is enclosed “by a waterproof  
 “ covering over the top, and secured close down the sides  
 “ when it is not required to dispense the contents. When  
 “ the contents of the stores are to be distributed this  
 “ covering is distended to form an awning all round, and”  
 the inventor fits “to this ambulance store bars or counters,  
 “ which may be at the ends and sides, to which there is suit-  
 “ able access by doors in the lattice work. The framing or  
 “ body of this ambulance store is mounted on suitable wheels,  
 “ and fitted with shafts or pole, and to be drawn by horses in  
 “ the ordinary manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 25.—No. 751.

SPENCER, JOHN, the younger, and SPENCER, MICHAEL.—Cast steel tires. This invention “relates to the manufacture  
“ or production of cast-steel tyres or hoops for railway and  
“ other wheels, and consists in casting such tyres or hoops in  
“ a solid ring, in a suitable mould or matrix; which ring is  
“ afterwards hammered, and when necessary may be finished  
“ by rolling in the usual or any other suitable manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 4.—No. 827.

WOODRUFF, ROBERT, and MILNES CHARLES.—(*Provisional protection only.*) — Perambulators. In the improved double perambulator “there are two seats placed back to back, the  
“ front seat facing the fore wheel or wheels, and the back seat  
“ facing the handle by which the carriage is propelled. From  
“ the centre of the handle a light rod springs, the opposite  
“ end terminating in a hook or clasp, to which is suspended a  
“ light frame composed of four pieces preferably of cane or  
“ steel, which being covered with any suitable light material,  
“ forms an umbrella, sunshade, or canopy of an oblong or  
“ other shape, the body being supported by springs.”

It is also proposed to “manufacture perambulators of  
“ such form that the child or children may sit with  
“ one side facing the fore wheel and the other facing the  
“ handle, that is to say, the back of the seats forms one side  
“ of the carriage, and a footboard is formed of the other  
“ side.” It is also proposed to construct them of double the  
“ width, so that they may carry four children, either sitting  
“ back to back, or knee to knee; that is to say, two children  
“ are to face the handle, and two to face the front wheel, or  
“ the children may sit sideways with their backs to the sides  
“ of the perambulator, or sidewise with their knees towards  
“ the sides of the carriage, there being in this construction  
“ two foot boards, one on each side of the carriage.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 5.—No. 838.

RICHARDSON, WILLIAM.—(*Provisional protection only.*)—Covering axles. “This invention relates to axles, shafts, and

“ other parts of machinery exposed to the action of the  
 “ atmosphere, and consists in coating, covering, or insulating  
 “ the same with vulcanised india-rubber, india-rubber cloth,  
 “ gutta percha, or other material capable of excluding  
 “ moisture and air. It is well known that the principal  
 “ causes of the breaking of the axles of railway carriages are  
 “ oxidation of the metal by exposure to wet, and crystalliza-  
 “ tion by the unequal expansibility and contractibility in  
 “ different directions by heat and cold. Now, the object and  
 “ intention of this invention is to protect the metal both from  
 “ wet and unequal expansion, and thus to prevent oxidation  
 “ and crystallization thereof.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 6.—No. 853.

GHISLIN, THOMAS GOULSTON.—(*Letters patent void for want of Final Specification*).—Material for whip sockets, &c. This invention relates to the application of “ a marine plant or  
 “ fungi, known to botanists as the *siklonia buccinalis*” to a large number of purposes, amongst which occurs the construction of whip sockets. The method of preparation or manufacture is not given.

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 9.—No. 866.

WRIGHT, JAMES.—(*A communication from John B. Murray.*)—(*Provisional protection not allowed.*)—Letter box for vehicles. This “ invention consists in combining a receiving letter box  
 “ with a city railway or tramway carriage. The box may be  
 “ of any convenient form, having the requisite slit or aperture  
 “ for receiving the letters, and may be placed in any portion  
 “ of the vehicle most easily got at, preferably in cars or  
 “ omnibuses at the rear, the box to be locked with a mail key,  
 “ which remains with the post office authorities.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 13.—No. 910.

DELANNOY, ALBERT FRANÇOIS.—Axle boxes. This invention relates to improvements upon the subject matter of former letters patent dated 6th August 1859, No. 1818. In construct-

ing the improved axle box, the patentee casts "with it the  
" lubricating apparatus or oil reservoir which projects laterally, and extends in a line with the axle or journal.  
" The axle box for receiving the axle or journal is of an elliptical form and is provided with a brass bearing, which  
" partly surrounds the journal. This bearing has cast with it  
" on its upper surface a projecting piece or key provided with  
" an opening, which receives the end of a set screw screwed  
" into the upper part of the axle-box for securing the bearing  
" to the axle-box. The axle-box is drilled with necessary  
" holes for the metallic ring and fixing bolts.

"The construction of the lubricating apparatus and the  
" mode of lubricating is as follows :—A wick or cloth is held  
" in contact with the axle or journal by means of a T-formed  
" bracket working in guides in the sides of the oil box, the  
" lower part of such bracket being hollowed out to receive a  
" spiral spring which is attached to a screw plug fitted into  
" the bottom of the oil box; the wick being attached by a  
" spring to the top of the T-bracket it is forced against the  
" axle or journal by means of the spiral spring before  
" mentioned, thus lubricating the journal, and when the oil  
" gets below the wick the lubrication is effected by capillary  
" attraction.

"To prevent the escape of oil and the introduction of  
" foreign bodies a leather washer or packing piece is applied  
" on the collar of the axle, and, extending as far as the bearing, closes the oil box. This washer can be fixed by screws  
" to the elliptical part cast with the oil box and surrounding  
" the journal. Against the hinder part of the axle a leather  
" washer is applied, closing hermetically the oil box. This  
" packing is secured in its place by a metallic ring fixed by  
" bolts to the box."

[*Printed, 7d. Drawing.*]

A.D. 1861, April 25.—No. 1036.

GARDINER, PERRY GREEN.—Springs. One form of spring is made "by combining a dished cup or piece of metal, with  
" a series of concentric steel discs to ensure their effective  
" action by excluding dust and water therefrom; the afore-  
" said series of discs" the patentee forms of "sufficient dia-

“ meters” and arranges “ said discs either in single plates, or two together, and” he places “ them over a ferrule, holes being made through them for that purpose, so that said ferrule only acts upon the discs near the centre thereof. By this arrangement the series of discs when under compression have liberty of free expansion near their central hole, which renders a spring thus formed soft and easy when in use, whereas were the discs clamped or rigidly connected together in the middle as commonly practised they would be non-elastic at such part. The aforesaid dished cup rests upon the outer rim of the largest steel disc, and is formed with a lip to exclude dust and water from the discs as before stated. The series of discs are connected together, and to the dished cup and ferrule aforesaid by a bolt passing through same, and tightened by a screwed nut. Another mode of constructing springs according to this invention consists in combining together a series of corrugated, conical, or dish-shaped discs of steel of different diameters; the corrugations may be made either radial or originating at or near the centre of the plate, and proceed to the periphery thereof in a voluted curve.” It is proposed to place a soft or malleable substance, such as felt, cloth, lead, india-rubber, gutta percha, copper, or their equivalents, between every two disc plates, to give a solid bearing to the series of plates. These plates are passed over a ferrule as is in the first described spring, but instead of using a dished cup as there described” it is proposed “ to connect another series of corrugated disc plates similar to those lastly described by means of a bolt and nut as before stated; the edges of the larger discs will thus bear upon, and the corrugations fit into each other, and thereby exclude dust and water.” The patentee also proposes “ to place a thick ring of india-rubber in the space between the two series of disc plates, so that when under extreme pressure the india-rubber shall serve as a cushion. If desirable, and when a great amount of the motion of the spring is required, two or more springs of the above construction may be connected one above the other by one long bolt passed through all of them, and tightened by a screwed nut.”

[Printed, 7d. Drawing.]

A.D. 1861, April 26.—No. 1058.

WATKINS, JOHN.—Axle and axle boxes. The axle is tubular up to the collar and has on its outer surface a reversed spiral groove to facilitate lubrication. The interior is tapped to receive a double screw bolt. The head of this bolt is hexagonal and is capable of fitting into a recess in the cap which is placed over the axle end. This cap is secured to the outer revolving box by pins which enter the flange of the cup and are kept in their places by springs. Should the axle screw bolt become unscrewed its head advances into the recess in the cap and the rotation of the latter at once screws up the bolt again. Upon the double screw is an expanding segment which keeps the outer box from sliding off the axle. Longitudinal chambers for lubricating matter are provided in the box, and these communicate by holes with the axle. The interior of the axle may also be adapted as an oil chamber. Various modifications of the improvement are shown.

[*Printed, 9d. Drawing.*]

A.D. 1861, May 1.—No. 1086.

HOLMES, ARTHUR EAST.—(*Provisional protection only.*)—Improvements in headed carriages. The following is the inventor's provisional specification:—"My invention consists in  
" connecting the hinges on which the top head pillars hang  
" somewhat below the joint of the standing body pillars, the  
" upper ends of which are slightly rounded or recessed. By  
" this arrangement the head of the carriage falls flat, and on  
" a level with the door top."

[*Printed, 3d. No Drawings.*]

A.D. 1861, May 2.—No. 1102.

GLATARD, LAURENT.—Releasing horses from vehicles and locking wheels. The patentee says, "The means by which I  
" propose to effect the instant release of a horse from the  
" vehicle to which it is harnessed is by constructing the  
" harness of the horse collar with springs, by which they will  
" be fastened in their usual position over the collar when the  
" horse is put to the vehicle; from this spring apparatus a  
" chain, cord, or strap will pass within reach of the driver.  
" If from the horse or horses taking fright, or any other

“ cause, the driver is desirous of releasing it or them from the  
“ carriage, on pulling the chain or cord the springs will  
“ release the hames, which sliding up will free the horse or  
“ horses from the traces by which it or they were attached to  
“ the vehicle, and permit it or them to run on, leaving the  
“ carriage behind. But although thus separated from the  
“ horse or horses the vehicle might still retain sufficient  
“ impetus to endanger the safety of its load, I therefore  
“ further propose (in connection with suitable gearing) to  
“ place within the seat of the carriage an eccentric barrel  
“ from which a chain will pass to a lever acting on skids  
“ beneath the vehicle. Upon the driver setting the gearing  
“ in motion the barrel will move round winding upon it the  
“ chain attached to the lever, and this latter will press the  
“ skids against the periphery of the wheels, and thus arrest  
“ the vehicle. As he locks the hind wheels the driver can  
“ maintain the fore part of the vehicle in a straight line for-  
“ ward by putting his foot on the head of a pin, which is  
“ kept up by a helical spring. The pin is maintained and  
“ can slide in a socket fixed under the box of the carriage  
“ and entering into another socket fixed to the fore train;  
“ the hole of the latter socket is enlarged at its upper part to  
“ allow the pin to enter freely.”

[*Printed, 10d. Drawing.*]

A.D. 1861, May 2.—No. 1106.

WRIGHT, PETER.—Metallic wheels. The following process as described by the patentee has reference to the use of wrought iron for naves. He however elsewhere observes that in place of naves made in the way described, cast naves of similar shape may be used.

“ I first prepare a die of the requisite section to give the de-  
“ sired form of one-half of the nave of the wheel, with a flange  
“ upon the periphery of the thickest part of the nave. I then  
“ take wrought or scrap iron, and heat it in a furnace until it  
“ is ready for my purpose, when I lay it in the die and force it  
“ into the die by blows from a steam or forge hammer, or by  
“ pressure applied until the heated metal completely fills the  
“ die. I then remove the metal from the die and take it to a  
“ hydraulic or other suitable press, by which a hole is made

“ through the centre for the axle ; the corresponding half of  
 “ the nave is then formed in the same manner. I then take  
 “ a disc or circular plate of wrought iron or boiler plate of  
 “ the requisite size and thickness, through the centre of which  
 “ a hole is cut corresponding with the hole through the nave ;  
 “ this disc is placed between the two halves of the nave, and  
 “ the whole is rivetted or bolted together, or in another way  
 “ I can take two discs of plate iron, and placing them one on  
 “ each side of the flange upon the nave, I rivet or bolt them  
 “ together through the flange ; or when a lighter wheel is  
 “ required, segmental pieces or arms may be rivetted or  
 “ bolted on to or between and through the flange upon the  
 “ nave in place of the solid disc. The next operation is that  
 “ of fixing on the tyre, which may be effected in various ways,  
 “ either by rivetting or bolting the disc or centre part of the  
 “ wheel to a flange formed on the inner periphery of the tyre,  
 “ or by rivetting T or angle iron upon the rim of the centre  
 “ part, when the tyre may be shrunk on and secured in the  
 “ usual manner, or by any other approved mode.”

[Printed, 10d. Drawing.]

A.D. 1861, May 6.—No. 1136.

PARAIRE, EDWARD LOUIS.—(*Provisional protection only.*)—  
 Propelling vehicles. The inventor says, “ I propose effecting  
 “ the propulsion by means of wooden or other blocks, securely  
 “ attached, bolted, or fixed to an iron shoe or patten receiving  
 “ a backwards and forwards movement, by a rod worked by  
 “ an eccentric or cam fixed on a shaft set in motion by a steam  
 “ engine or other mechanical contrivance ; to such is attached  
 “ the patten or shoe above described. I also propose that  
 “ such invention should further consist of a second combina-  
 “ tion of excentrics or cams fixed on another shaft, to which  
 “ excentrics or cams is attached a spring rod, the extremity of  
 “ which is also connected with the patten or shoe, the purpose  
 “ of which is intended to elevate or lower the said patten or  
 “ shoe, and to produce thereon a downward elastic pressure.  
 “ I contemplate that two or more excentrics fixed on a shaft  
 “ and acting at different movements will, by the action  
 “ exerted on the road, produce the movement of propulsion.  
 “ Therefore, two combinations being employed produce one a



“ forward, the other a backward movement of the whole. To  
“ prevent any sudden jerk caused by the uneven surface of  
“ the road, the bearing or plumb blocks in which the shafts  
“ carrying the excentrics or cams revolve, are pressed down-  
“ wards by springs or other elastic substance. I further  
“ propose that the whole apparatus by a lever or other mecha-  
“ nical contrivance should be elevated above the surface of  
“ the road, by which means either the forward or backward  
“ movement can be brought into immediate action. By this  
“ arrangement the apparatus may be worked jointly with the  
“ wheels carrying the general machinery, or may be worked  
“ separately. The wheels being thrown in or out of gear  
“ could therefore be used as a sustaining or propelling  
“ power.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, May 8.—No. 1169.

WILLIAMS, PHILIP HENRY.—(*Provisional protection only.*)—  
Adaptation of metal plates to the construction of carriages, &c.  
“ This invention consists in taking plates or sheets of iron or  
“ other suitable metal, and bending or turning over the edges,  
“ or some of the edges thereof, in such form and manner that  
“ the edge or edges of one plate or sheet may be readily fitted  
“ into the edge or edges of another, leaving the plates or sheets  
“ secured together, having ridges at the joints, and the same  
“ may be securely locked or fastened together by pins or  
“ bars or in any other suitable manner, and may be readily de-  
“ tachable, and capable (when not made up as a structure  
“ or construction) of being packed together in a compact  
“ manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, May 9.—No. 1172.

LENNY, CHARLES.—“ Improvements in carriages.”

This invention “ consists in the bodies of carriages being  
“ constructed wholly or in part of rods or bars of metal  
“ arranged convenient distances apart so as to form an open  
“ work body in place of wood, wickerwork, or otherwise, as  
“ at present, the said body being painted and lined, stuffed,

“ or cushioned in such manner as to admit of the cushions,  
“ lining, or otherwise being seen through the said openwork  
“ body, or covered in by any suitable method in such parts as  
“ may be required.”

[*Printed, 6d. Drawing.*]

A.D. 1861, May 10.—No. 1187.

DUNLOP, ANDREW.—Portable railway. Under one modification of these improvements “each wheel of the vehicle runs  
“ upon a series of short rails, which are jointed together at  
“ the ends, so as to form a flexible band, as it were, surround-  
“ ing the periphery of the wheel. The rails are connected  
“ together in pairs by means of rods of malleable iron, that  
“ is to say, each rail is connected to the one that is diametri-  
“ cally opposite to it. The rods, which are jointed to the  
“ centres of each pair of rails, extend inwards towards the  
“ centre of the wheel, where they are connected by means of  
“ moveable links to each other and these links are also jointed  
“ at their centres to a ring having two laterally diverging  
“ arms, which ring runs loosely on the axle. This arrange-  
“ ment is adapted for wheels keyed to the axle, but where the  
“ wheel runs loosely on the axle the ring runs upon a bush  
“ projecting laterally from the nave of the wheel and encircling  
“ the axle. The rods with their connecting links thus form  
“ a series of parallelograms around the axle, the motion of  
“ the wheel causing the several pairs of rails to move regularly  
“ and accurately round its periphery. The ends of the rails  
“ where they are jointed together are fitted with adjustable  
“ chairs, which support the rails a short distance above the  
“ ground, and adjust themselves to the inequalities of the  
“ road. The overlapping ends of each pair of rails are bored  
“ to admit of a strong bolt passing through the holes; this  
“ bolt forms the axis of the joint, and its extremities are  
“ supported in two short beams of iron arranged one on each  
“ side of the ends of the contiguous rails. The beams are  
“ formed with screwed ends, and are attached by nuts to a  
“ curved plate at each end which passes below the rail. These  
“ curved plates are of a segmental figure, their extremities  
“ extending to about the level of the upper surface of the  
“ rails. Each curved plate rests in the adjustable chair, the

“ inner surface of which corresponds in figure to the curvature  
“ of the plates. In this way the chairs are moveable about  
“ the plates to a given extent, and this motion is facilitated  
“ by fitting to the upper part of the chair on each side an  
“ antifriction roller, which moves over the inner face of the  
“ segmental plates. The chair consists of two side plates  
“ with these antifriction rollers between them, and at the  
“ lower part they have pendent lugs, to which are jointed  
“ conical metal blocks, each of which is formed with laterally  
“ projecting journals, which support a metal ring that moves  
“ freely about the journals. The rings rest upon the ground,  
“ and their connection with the side plates of the chair give  
“ them the flexibility of a universal joint. Each chair rests  
“ upon two of these supporting rings or feet, and there are  
“ two chairs to each joint of the rails.”

[*Printed, 11d. Drawings.*]

A.D. 1861, May 14.—No. 1222.

HILDEBRAND, AUGUST FRIEDRICH.—(*Letters Patent void for want of Final Specification.*)—Propelling and steering vehicles. The propulsion is effected by means of a treadle, which works a cranked axle by means of chains. This axle is placed longitudinally in the vehicle and drives the hind wheels by means of gearing. The chains from the treadles pass round pulleys to the cranks. The front wheels are steered by means of a drum and gearing. Round the drum is passed a chain which also passes round a pulley at the rear of the vehicle. This chain may be worked by hand. The frame carrying the steering apparatus is capable of turning on a horizontal axis projecting from the carriage, so that one or other of the front wheels may rise or fall on uneven ground without disturbing the working of the gearing. Friction rollers are adapted to the locking plate and frame.

The same design can be used for carriages intended for the transport of heavy bodies. Crank handles may be substituted for treadles. The wheels are secured firmly upon the axles so that the latter rotates.

[*Printed, 3d. No Drawings.*]

A.D. 1861, May 16.—No. 1245.

WATSON, ALEXANDER T.—“Springs for railroad cars and  
“ for carriages, and for many other purposes for which springs  
“ are used or required.”

According to this invention a framework or setting is in the first place provided for the reception of steel plates which constitute the spring, this framework consisting of an upper and a lower part, placed at some distance asunder, but connected, if desirable, by an interlocking joint, formed by a projecting piece from each entering an opening in the other, the two parts being thus capable of advancing towards or receding from each other, but being incapable of horizontal action. In each of these parts are recesses or jaws, and into these are inserted the ends of flat steel blades, of different length and curvature, the ends of the blades being rounded, and thus upon pressure being exerted upon the upper part of the framing (for example), the longest blades are acted upon first, and as the pressure increases, those next in length, and so on in succession, “the spring thus graduating itself to the “load.” The blades are arranged in pairs, their position being vertical, or nearly so, and the different pairs may be of different thickness, as well as of different length and curvature. In order to sustain the blades in case of extreme pressure being brought to bear upon them, the two parts of the frame are furnished with curved projections, against which the blades in such a case will rest.

[*Printed, 6d. Drawing.*]

A.D. 1861, May 18.—No. 1279. .

STEVENS, BENJAMIN FRANKLIN. — (*A communication from Mr. Simon Stevens.*)—Traction engine. This engine is supported at one end upon guide wheels as usual, and at the other upon a barrel shaped drum. This drum is rotated by means of gearing on wheels running on guide rails in the drum, driven by a crank shaft which passes through it longitudinally. Within the drum is also placed the water tank. The drum may be made in halves, so that each half may be driven independently and thus facilitate turning.

[*Printed, 6d. Drawing.*]

A.D. 1861, May 21.—No. 1294.

PARFREY, YOUNGS.—Wheels. “This invention has for its  
“ object improvements in the construction of carriage wheels,  
“ and is applicable when using india-rubber rings around the  
“ peripheries of carriage wheels. The improvements consist  
“ in employing interior of such rings of india-rubber a strong  
“ ring or hoop of inelastic material, preferring iron for the  
“ purpose, which will not be liable by use to be extended in  
“ diameter. The internal ring or hoop is made of less  
“ diameter than the outer diameter of the wheel to which it  
“ with its coating of india-rubber is to be applied. The ring  
“ of india-rubber (containing the interior inelastic ring or  
“ hoop) is placed in a suitable groove or recess around the  
“ tyre or other circumference of the wheel, the india-rubber  
“ projecting or extending beyond the walls or sides of the  
“ groove or recess formed around the wheel, as has heretofore  
“ been the case when using india-rubber rings on carriage  
“ wheels, but by reason of the inelastic ring or hoop being  
“ of less diameter than the outer circumference of the wheel,  
“ and by reason of its being within the groove, the india-  
“ rubber ring will be prevented expanding in diameter when  
“ in use so as to get out of the groove or recess around the  
“ wheel. The india-rubber used for this purpose is to be  
“ rendered permanently elastic in the ordinary manner by  
“ sulphur or sulphur compounds and heat. The inelastic  
“ interior ring or hoop may be clothed with india-rubber in  
“ different ways, but it is preferred to employ short hollow  
“ cylinders and to slide them on to the rod or bar, which is  
“ to constitute the inner inelastic ring and to compress them  
“ thereon, so that the two ends of the bar or rod may be  
“ allowed to protrude a distance to admit of such ends being  
“ welded or otherwise connected together. The groove or  
“ recess around the wheel may be of any convenient form,  
“ and made in any suitable manner.”

[*Printed, 7d. Drawing.*]

A.D. 1861, May 23.—No. 1312.

PARTRIDGE, EBENEZER.—Lubricating axles. This invention  
“ consists in casting on, or in screwing into, or otherwise  
“ fixing on or making in the axle box a pipe or channel

“ leading into the lubricating chamber, and in closing  
“ such pipe or channel by a screw plug. By simply  
“ removing the plug and pouring in oil or other fluid  
“ lubricant through the pipe or channel, without taking  
“ the wheel off the axle, the oil will find its way into the  
“ lubricating chamber; the plug has then to be screwed in,  
“ and this operation repeated as often as fresh lubricating  
“ matter is required, always without the necessity of removing  
“ the wheel.”

[*Printed, 5d. Drawing.*]

A.D. 1861, May 27.—No. 1331.

LEE, JOSEPH, and TAPLIN, BENJAMIN DUTTON.—Traction engines. The engine is supported upon four wheels with wrought iron rims and spokes and cast iron naves. The spokes are “ drawn taper with a shoulder at the top which  
“ fits between two angle irons.” “ The traction gear consists  
“ of a pitch chain working upon a small wrought iron cog  
“ wheel, lined with leather between the cogs, fitted on the  
“ crank shaft of the engine, and a large cog wheel upon the  
“ hinder axle of the carriage wheel, thereby obtaining a simple,  
“ effective, and direct action from the crank shaft of the engine,  
“ to the hinder travelling wheels. The axle tree upon which  
“ the chain wheel is made fast is fitted to the front end of the  
“ fire box part of boiler, and is supported by two brackets  
“ which are securely fastened to the boiler, upon the bearings  
“ of these axle trees are fitted two carriages which are bolted  
“ on these brackets that are secured to the boiler. In the  
“ brackets and upon the carriages provision is made by means  
“ of slots to allow the carriages to move backwards and  
“ forwards five or six inches for the purpose of tightening the  
“ chain at pleasure.

The invention also consists “ in arranging the carriage  
“ axles so that they move backwards and forwards at pleasure  
“ by means of adjusting screws, eccentrics, or otherwise.”

The second part of the invention consists “ in improve-  
“ ments in apparatus for raising and lowering the front end  
“ of the boiler when going up or down hill or along irregular  
“ roads for the purpose of maintaining an equal amount of  
“ water upon the fire box end of the boiler under all circum-  
“ stances.” This is effected by a screw of suitable size fitted

to the screw plate at the front end of the boiler and worked from the foot plate when necessary by the attendant.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1861, June 17.—No. 1542.

SIMPSON, HORTENSIVS COATES.—Two wheeled vehicle. “The  
“ body of the vehicle covers or encloses the upper halves  
“ of the wheels, and is supported on the axle by springs five  
“ feet long attached to the shafts in the ordinary manner.  
“ The body is connected to the shafts by means of two arched  
“ bars or stays, which crossing each other in the centre nearly  
“ over the axle, are continued outwards as rest for the whole  
“ of the body and footboards, and are rivetted or screwed to  
“ the shafts. The lower ends of each bar or stay are fixed to  
“ the lower corners of the body, one end of each bar being  
“ fixed to the back corner of one side and to the front corner  
“ of the other side. Moveable seats outside the vehicle may  
“ be arranged to carry from two to six persons. Two seats  
“ may be fixed on the top nearly over the sides of the body  
“ over the wheels, and seats two may be placed on each  
“ side of the body about midway between the top and bottom  
“ of the body about level with the shafts or springs. The  
“ seats on the top may be placed so that their occupants may  
“ either look in the direction of the vehicle’s motion, or sit  
“ sideways as in an Irish car. The seats on the sides are  
“ placed so that their occupants sit back to back, those in  
“ front looking in the direction in which the vehicle is moving  
“ and those behind in the opposite direction. The seats are  
“ all made so as to be readily fixed and removed, and folding  
“ footboards are provided for the side seats. The horse is  
“ much nearer the axle than in ordinary vehicles, the hind  
“ part of his body occupying the open front part of the body  
“ of the vehicle beyond the axle. The hind part of the vehicle  
“ forms a capacious receptacle for luggage. In the centre  
“ between the two upper seats is space for one or two persons  
“ to sit who can use the luggage board for a footboard. In  
“ the paneled boxes, which are outside the wheels and form the  
“ body of the carriage for the footboard of the upper seats  
“ as well as of the lower seats, is a centre box or opening, in

“ which the bush of the wheel plays, thus reducing the  
“ width of the vehicle.”

[*Printed, 10d. Drawings.*]

A.D. 1861, June 20.—No. 1594.

BARTHOLF, JOHN HENRY.—(*A communication from George Boss Hartson.*)—(*Provisional protection only.*)—Nursery chair and perambulator. This invention relates to the construction of a chair for the use of a child; but mention is made of “ a low-sided carriage made of a shape to contain the  
“ said chain, which can be set therein, and held by straps or  
“ otherwise, so as to form in combination with the said  
“ carriage a child’s perambulator.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, June 20.—No. 1595.

MARSILY, WILLIAM EDOUARD.—(*Provisional protection only.*)—Velocipedes. The framing is low but it carries bearings for large driving wheels. These wheels are on a crank axle worked by treadles carried on the framing. These treadles may have india-rubber springs. A seat or leaning support is provided for the occupant. The velocipede is steered by means of the front wheels which are controlled by a handle. Additional cranks may be fitted, to be worked by hand through levers and connecting rods. If desired the naves of the wheels may be made hollow, and springs then inserted between the inside of the nave and the axle box.

[*Printed, 3d. No Drawings.*]

A.D. 1861, July 2.—No. 1683.

ADAMS, SAMUEL.—(*Provisional protection only.*)—Improvements in tramway cars, &c.—These improvements consist firstly in a contrivance “ for locking and disengaging the pole  
“ of omnibuses for street railways. This is accomplished by  
“ a double or two-ended lever which is acted upon by the  
“ driver’s feet, so that when the vehicle is off the rails or  
“ metals the pole is fixed and the lock in action, and when on  
“ the rails the pole is loose and the lock fixed; the fixing of  
“ the pole to the lock is by a pin or bar of iron or steel



“ having a fork at the lower end, the other end is a bolt ;  
 “ the fork end fits on and partly clips the pole when down,  
 “ and thus fixes it to the lock ; the forked pin is moved up  
 “ and down by being connected indirectly to the lever foot  
 “ when the forked bolt is up the bolt end slides into a socket  
 “ fixed to the landing.”

The break apparatus which can be worked by either driver or conductor or both “ consists of levers, two to each hind  
 “ wheel, one on each side ; the levers are acted upon by rods  
 “ and chains ; the long ends of each pair of levers are connected together by chains which have the form of a rhombus or diamond ; two opposite corners are connected to two  
 “ of the levers, and the other corners are connected to the  
 “ rods, and so on to the rotating break handles ; the blocks  
 “ or rubbers are prevented when not in use pressing the  
 “ wheels by a coil spring.

“ The next part is an improved roof stick or ‘ principal,’  
 “ consisting of four pieces of wood ; the two supporting pieces  
 “ are dovetailed into the cant rail and are nearly straight,  
 “ crossing each other at an angle of about  $17^{\circ}$  ; the upper ends  
 “ are mortised to two segments which form an O.G. on each  
 “ side, the centre being of most convenient, strong and  
 “ elegant form for the roof of an omnibus. The travelling  
 “ wheels revolve on fixed axles and have oil boxes.

“ Also a sweeping or scraping apparatus is fixed to the axle  
 “ to pass in front of the travelling wheels to clear the  
 “ metals.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, July 3.—No. 1688.

SIMONTON, JOHN.—(*Provisional protection only.*)—Traction engine. The invention consists, first “ of an endless railway  
 “ or platform placed below the frame of the engine.

“ Secondly, a mode of preventing priming in the boilers of  
 “ such portable engines, by suspending the boiler from a  
 “ centre of oscillation above it. The steam leaves the boiler  
 “ by a cross pipe concentric with the gudgeons (above the  
 “ level of the water), on which the boiler is suspended, such  
 “ cross pipe being in communication with the steam dome or  
 “ highest part of the boiler. The feed pipes are fitted with  
 “ hinge or swivel points to allow for the motion of the boiler.

“ The endless railway or platform consists of rails, wheels,  
“ and sleepers, arranged in an inverted order from that of an  
“ ordinary railway, the rails being fixed to the frame of the  
“ engine, run over and upon the wheels while the wheels are  
“ connected to and supported by the cross bars or sleepers ;  
“ the sleepers are jointed or hinged together in the form of  
“ an endless band or chain, and which constitutes the moving  
“ platform. These cross sleepers are of an angular form in  
“ cross section, and have their apices downwards when on  
“ the ground. The endless chain of sleepers is of a breadth  
“ and length about equal to the area of the engine, or it may  
“ be more or less extended. The engine will impel itself  
“ over the travelling railway in a right line from end to end  
“ of a field ; turning round can be provided for by having  
“ three running wheels, which can be pressed downwards  
“ towards the earth by screws actuated by the engine or  
“ otherwise, thus lifting the engine and railway free of the  
“ ground altogether ; then by driving one side wheel by  
“ chain, band, or other means, the engine will swing round ;  
“ it may also be steered by analogous means.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, July 10.—No. 1744.

CHELLINGWORTH, THOMAS TERTIUS, and THURLOW, JONATHAN.—Traction engines. The framing of the engine described by the patentees is made of iron plates arranged in four lines or cheeks. Between the inner pair the boiler is suspended upon trunnions near one end resting upon a screw support at the other. In each of the outer spaces is placed a cylinder, with its gear, and a driving wheel in bearings on each side. The level of the water in the boiler is maintained by means of the screw support which is worked when necessary from the engines, by means of ratchet and pall gear. The feed and steam pipes are jointed. The exhaust is heated and so rendered invisible. The leading wheels are attached to a fore carriage which locks round a central perch pin. Friction rollers are inserted between the locking plates, and several methods of controlling the locking movement for steering purposes, are given. The driving wheel resembles two wheels joined by one ring of felloes and one tire. That is to say

there are two naves and two sets of spokes. Between the outer and inner tires is a layer of india-rubber. The naves and spokes are of iron; that part of the periphery between the two sets of spokes is of wood. A toothed wheel or rim is attached to the inner set of spokes to take the driving pinion. There are also spuds which project through openings in the tire and are withdrawn, by means of excentrics on the axle. Hauling and crane attachments may be provided if required.

[*Printed, 4s. 9d. Drawings.*]

A.D. 1861, July 13.—No. 1767.

SMITH, THOMAS, and TAYLOR, GEORGE.—Cultivators and wheels. “In constructing wheels for horse rakes, cultivators, and other carriages, the spokes are made of iron tubes (or otherwise hollow at their outer ends), which are filled at their ends with wood, iron, or other material, and around such ends an iron ring is fixed by spikes or bolts driven through the ring into the interior of the spokes, and on the ring so fixed to the spokes a suitable tyre for running on land is shrunk.”

[*Printed, 10d. Drawing.*]

A.D. 1861, July 22.—No. 1837.

WATSON, ARCHIBALD.—(*Provisional protection only.*)—Brake. “In carrying out the invention advantage is taken of the resistance which the horse exerts against the downward pressure of the vehicle, to cause brakes to be applied to the wheels, and so increase the resistance to their turning. In one modification of apparatus for this purpose, chains are passed from the ordinary ‘breeching,’ or from an equivalent strapping passing round the hind quarters of the horse forward to pulleys or levers carried by the shafts. From these pulleys or levers chains pass back to levers carrying the brake blocks, or an equivalent connection is made with the brake levers in such a way, that when the horse holds back the chains will be strained and will act on the brake levers, causing the brakes to be pressed against the wheels. Provision is made for preventing the brake action taking effect when it is required to make the horse back the cart.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, August 6.—No. 1957.

NEWTON, ALFRED VINCENT.—(*A communication from Thomas Rainey.*)—Reversible seat. “The reversible seat consists of  
 “a framing composed of end pieces, connected together by  
 “cross bars, and fitted with bearings to receive the journals  
 “of a rocking board or cushion, which forms the seat proper.  
 “Under this seat and at each end thereof a metal plate is  
 “applied, which plate is formed with stop pieces at its extremities, and at its under side is provided with a pair of  
 “lugs. These lugs are fitted with journals, which are supported in bearings or sockets in the end pieces of the  
 “framing. Outside these end pieces are radius rods, which  
 “have their fulcrum in the lower part of the framing, and in  
 “a line with the centre thereof. The radius rods are braced  
 “together at their upper part by a back board, and at about  
 “a level with the seat they are formed with guides, into  
 “which the outer edges of the stop plates project. When,  
 “therefore, these rods, which constitute the supports of the  
 “back, are swayed they will rock the seat proper, and  
 “elevate one or other edge thereof, as desired. To bring the  
 “seat to the determined inclination a supplementary loose  
 “back, swinging on pins and coupled at its lower end to the  
 “radius bars by links, may be employed when desired.  
 “Where a slight inclination only of the seat is required, the  
 “stop plates are made straight, but by curving them the  
 “inclination will be increased.”

[Printed, 7d. Drawing.]

A.D. 1861, August 7.—No. 1963.

HUGHES, EDWARD THOMAS. — (*A communication from Jean Mathieu Rey, junior.*)—“Wheelbarrow waggon.”

“This invention consists of making the shell or mouth part of  
 “the barrow to move on a centre or eccentric attached to the  
 “framework, so that when it is to be emptied it can be upset  
 “in the same manner as the ordinary shoot waggon used by  
 “excavators. Two wheels may be used for ordinary roads  
 “and four for railways. This swing or shooting wheelbarrow  
 “is applicable to all ordinary purposes, or may be used very  
 “advantageously for the excavations for railways.”

[Printed, 6d. Drawing.]

A.D. 1861, August 10.—No. 1993.

STOCKER, ALEXANDER SOUTHWOOD, and STOCKER, ALEXANDER RICHMOND.—“Improvements in the manufacture of horse-shoes, boot heels, wheel tyres, nails, and safes.”

In preparing bars and plates for the purpose above-mentioned, according to the invention, puddled bars or plates of wrought iron are placed in an ordinary converting furnace, and operated upon in the same manner as is generally practised when converting iron into steel. “These bars or plates are intended only to be partially converted, so as to leave the inner part of the metal in its fibrous condition, whilst the outer surface or surfaces are hardened to a greater or less depth, and on one or more of its surfaces, as circumstances may require;” they are then formed into “a pile of any desired number also of suitable length, breadth and thickness.” The pile is then heated to a fusing or welding temperature, and passed through an ordinary rolling mill, whereby the whole becomes thoroughly incorporated and welded together in one solid mass, and rolled out to dimensions requisite for the purpose intended.

[Printed, 4d. No Drawings.]

A.D. 1861, August 12.—No. 2002.

GEDGE, WILLIAM EDWARD.—(*A communication from Alfred Tabuteau.*)—Brake. After making some observations upon the disadvantages attendant upon the system of working brake blocks by means of screws and cranks, frequently adopted, the patentee mentions that he has employed in preference “what may be termed knee power, which (it is believed) was first indicated by the celebrated mechanician ‘Poincot,’” the advantage obtained by this mechanism being duly set forth. Different modes of carrying out the invention are described, in one case a band or ring, carrying three fixed points or studs having arms connected thereto, being used, these arms being employed in connection with the brake lever; while in another case a “draw rod” is constructed in two parts, being re-united by means of a small beam or plate which is jointed thereto, and in each case a hand lever being used to place the apparatus in or out of action, as requisite.

[Printed, 7d. Drawing.]

A.D. 1861, August 20.—No. 2063.

INGRAM, GEORGE.—Portable railway. This invention consists in the construction of an endless tramway for the wheels of vehicles by joining together a number of channelled links. The chain so formed is passed round the wheel and also round a smaller or supporting wheel which is secured to an arm forming part of the framing or fixed axletree. Where a train of carriages is employed one endless railway may be used for all the wheels on one side, thus forming a continuous channel way from front to rear of the train.

[*Printed, 9d. Drawing.*]

A.D. 1861, August 28.—No. 2145.

CARPENTER, SAMUEL. — (*Provisional protection only.*) —

“ Wheels. This invention has for its object improvements in  
“ the construction of carriage wheels. For these purposes in  
“ constructing carriage wheels where wood spokes and wood  
“ felleys are used in place of the end of each spoke entering  
“ the felley as heretofore, a double metal socket is applied to  
“ the end of each spoke in such manner that the end of the  
“ spoke which ordinarily comes next the felley is received  
“ into the larger portion of the double socket, whilst the  
“ smaller part of the wood, which ordinarily passes into the  
“ hole or recess formed to receive it in the felley, enters the  
“ smaller portion of the double socket, and that smaller  
“ portion of the double socket enters the hole or recess in the  
“ felley, such hole or recess being made larger for the purpose  
“ of receiving the smaller portion of the socket together with  
“ that part of the end of the wood spoke which is therein;  
“ but it is preferred that the end of the spoke which enters  
“ the smaller portion of the metal socket should be made less  
“ than it ordinarily would be, and the smaller portion of the  
“ metal socket made exteriorly of the same dimensions as the  
“ end of the spoke would be if no metal socket were used.  
“ The double sockets may be made of any suitable metal, but  
“ it is preferred that they should be made of malleable cast  
“ iron. In some cases in addition to the smaller part of the  
“ socket entering the felley the same is fixed thereto by a

“ pin or screw passed through the felley into the spoke, the head of such pin or screw being covered by the tyre.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 3.—No. 2194.

GRESHAM, JAMES.—(*Provisional protection only.*)—Stopping and starting vehicles. This invention consists “in the use of springs, air, or other elastic medium, weights, or the pressure of the atmosphere. The springs are charged, the air or other elastic medium is compressed, the weights are lifted, or the atmosphere is withdrawn from a cylinder by mechanism brought into gear with the wheels of the vehicle by a suitable lever handle, and connecting and transmitting mechanism when the vehicle is to be stopped; then, when the vehicle is to be set in motion again the force thus reserved and accumulated will be made, by means of reversing gear, to react upon the wheels of the vehicle, and start or assist the starting of the vehicle into motion. The weight, piston, or spring may be connected by a rope, chain, or strap with a pulley, which is geared and arranged so that when the wheel of the vehicle is moving forward the pulley can be brought into gear with it so as to turn in the opposite direction, this will retard and stop the vehicle; then by reversing the clutch, the pulley is made to gear directly with the wheel of the vehicle; when the force reserved and accumulated will act to start the vehicle, as the pulley and the wheel of the vehicle will then both turn in the same direction. In place of the toothed gear a spiral spring may be employed, placed in a box formed by two discs, one within the other, each free to rotate separately, and both placed free to rotate on the boss or nave of the wheel of the vehicle; one end of the spring is secured to one disc, the other end to the other disc; both discs are arranged so as to gear when required with a clutch carried round by the wheel of the vehicle. When this mechanism is to be used one of the discs is brought into gear with the wheel of the vehicle and the other is held so that it is prevented from revolving, and thus the spring becomes charged, and when the force thus reserved or accumulated is to be used, the disc which is in gear is brought out of gear, and

“ that which is out of gear is brought into gear with the  
 “ wheel of the vehicle (by passing the clutch from one to the  
 “ other), and that disc which is held is liberated, and that  
 “ which was connected with the wheel is held to prevent it  
 “ from revolving, and thus the reaction of the spiral spring  
 “ operates upon the wheel of the vehicle so as to turn it in  
 “ the direction of progression.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 5.—No. 2209.

RIDGES, JOHN EDWARD, and BARKER, JAMES.—Funeral carriage. This carriage is supported upon four wheels. The coffin is carried in a compartment over the front wheels. This compartment is connected with the carriage body on the hind wheels, by bars above and below, so that the whole vehicle is, so to speak, hinged between the front and hind wheels. When the coffin is to be placed in its compartment, the hinder carriage is drawn up at the roadside and the horses slightly inclined across the road, thus the door or opening at the rear end of the compartment, usually masked by the carriage body is opened. Over the front compartment may be fitted seats for attendants and a roof if desired.

[*Printed, 10d. Drawing.*]

A.D. 1861, September 5.—No. 2212.

PENSAM, JOHN TAYLOR.—(*Provisional protection only.*)—Increasing adhesion in wheels and propelling vehicles. For the former purpose spuds or “legs” are fitted to the wheel. The inventor says the wheel “ may be constructed with a double or  
 “ inner and outer tire, a certain distance apart, each tire  
 “ being pierced with holes, through which the sliding legs  
 “ may be placed, such legs being provided with a projecting  
 “ pin at the side, which confines the sliding of the said legs  
 “ to a distance equal to that between the tires. This pin or  
 “ projection is also acted upon by a guide fixed at the side of  
 “ the wheel, but not to it, which guide if continued round,  
 “ would describe a curve resembling an epicycloid with a  
 “ concave base, such cavity being the course the pins or  
 “ projections describe, whilst the outer extremities of the



“ legs describe a straight line or act upon the ground. A  
“ spring may be attached to this concave portion to increase  
“ or regulate the bite of the legs upon the ground.”

The invention consists secondly “ in a series of springs used  
“ as a portable medium for power, so arranged that one or  
“ more may be caused to act at pleasure upon the wheels, as,  
“ for example, if circular springs are used, each spring may  
“ be placed in a case, with a clutch box and ratchet wheel on  
“ the sides, and the series being on one axle, one, two, or three  
“ can, by moving the coupling levers, clutch with their  
“ fellows, or a driving wheel, and on raising the lever release  
“ the ratchet wheel, when a rotary motion will be produced,  
“ which will propel or assist in propelling the carriage. A  
“ regulator on the principle of the speed pulley may be  
“ applied, if required, to equalize or govern the action of the  
“ springs.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 6.—No. 2226.

ALLOTT, WILLIAM, and THELWALL, JOHN.—(*Provisional protection only.*)—Wheel tires. The following is the inventor's provisional specification. “ In manufacturing wheel tyres,  
“ hoops, and other metal articles of an annular form accord-  
“ ing to our invention, we produce two rings, composed each  
“ of a bar coiled in a helical form, the coil of the one ring  
“ being in the opposite direction to that of the other, and the  
“ ends of the bar being tapered off so as to leave an even face  
“ on the ends of the helix or side of the ring. One of these  
“ rings is made of smaller diameter than the other, and is  
“ fitted inside the larger one, and as they are coiled in  
“ opposite directions the joints or seams will cross each  
“ other, thereby considerably increasing the strength of the  
“ tyre or hoop, which is free from the usual weld and is not  
“ liable to split as ordinary tyres are; any desired number of  
“ such rings or coils may be inserted one inside the other,  
“ according to the strength and dimensions of the tyre to be  
“ produced, care being taken that no two adjoining coils are  
“ in the same direction, in order that the crossing of the  
“ seams or joints may be insured. The blank tyre or hoop  
“ thus formed is now welded under the steam hammer, and

“ then finished by rolling in the usual or any other suitable manner.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 10.—No. 2256.

TYSON, THOMAS SMITH.—(*Provisional protection only.*)—Self-acting lubricator.

This lubricator “ consists of an enclosed vessel or receptacle of rectangular or other suitable form, and of convenient size, to contain oil or other fluid lubricant, with chambers in connection therewith of suitable capacity to hold one supply or discharge of the lubricant according to requirement, and having tubes for conducting the same to where required. When this vessel or lubricator is applied to corves or waggon having a tipping or tilting action or motion, the supply of oil or other lubricant to the axis of the wheels is rendered self-acting. The lubricators are fixed to the body of the cart, which when tipped or tilted the chambers become filled with oil, which gradually passes out through the tubes to the axis of the wheels while the cart is running; the quantity supplied at each tilt being regulated by the capacity of the chamber, and the distribution of it by the bore or size of hole in the tube.

“ This lubricator may be so arranged and applied to other axes or bearings, as to be tilted by hand when required.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 13.—No. 2272.

DAVIS, WILLIAM.—Rein holder.—Several forms of the apparatus designed by the inventor for holding in horses, are described. They all consist in using a vertical staff to which the reins are hooked, and which when necessary can be put under extreme constraint by the rotation of the nave of the wheel with which it is in connection.

[*Printed, 10d. Drawing.*]

A.D. 1861, September 14.—No. 2296.

HAWKSLEY, GEORGE.—(*Provisional protection only.*)—Facilitating turning in traction engines. “ The two driving wheels of a traction or locomotive engine are fixed on separate

“ axes, and the ends of these axes are received into and freely  
“ turn within the nave of a toothed wheel. On the axis of  
“ each driving wheel is a bevilled toothed wheel, these  
“ bevilled wheels gear into the opposite sides of one or more,  
“ and by preference, more than one bevilled toothed wheel,  
“ the axes of which are carried by the toothed wheel into  
“ the nave of which the ends of the two axes of the  
“ two driving wheels pass. Motion is given to this toothed  
“ wheel by means of a cog wheel or pinion on an axis  
“ driven by the engines. By these means so long as it is  
“ desired that the traction or locomotive engine shall be  
“ propelled in a straight line, the two driving wheels will be  
“ actuated by the bevil wheels equally ; but when it is desired  
“ that the traction or locomotive engine should turn, then the  
“ driving wheel which for the time being will perform in the  
“ outer or larger curve, will be turned more quickly than the  
“ other driving wheel which is to perform in the inner or  
“ smaller curve. It is not essential that the bevilled toothed  
“ wheels should be on the axes of the driving wheels, as the  
“ driving wheels may be driven by pinions acting in toothed  
“ wheels fixed to the driving wheels, and the axes of the pinions  
“ may then receive motion in a similar manner to that above  
“ described in respect to the axes of the driving wheels, in  
“ which case it will be desirable that the pinion axes should  
“ be hollow, and the cog or toothed wheel which carries the  
“ bevilled toothed wheel or wheels, turn on a fixed shaft or  
“ axis.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 14.—No. 2297.

NEWTON, WILLIAM EDWARD.—(*A communication from William Goode Caporn.*)—(*Provisional protection only.*)—Checking progress of carriages. In applying the invention to railway vehicles “in which the running wheels are usually keyed fast to the axle,” a strong ratchet barrel is fixed upon each axle, with which a pawl or pawls may conveniently be brought to engage, such pawl or pawls being so arranged as to be kept out of contact with the ratchet until required to act, and to be dropped into contact therewith when it is requisite to check the progress of the carriage, the result being that the axles and wheels are prevented from rotating, and the latter caused

“ to slide along the rails, creating such an amount of friction as speedily to bring the carriage to a stand. The axles of all the carriages or waggons of a railway train may be provided with similar apparatus, two ratchet barrels, however, being by preference placed upon such axle, the teeth of one pointing in the opposite direction to those of the other, and each being provided with its own pawls, by which means the apparatus may be brought into action “ whichever end of the carriage “ may be advancing.” The pawls may be either under the command of the guard or some other attendant of the train, or they may be so combined with the traction apparatus of the train as to be raised from the ratchet when the train is being drawn forward in the ordinary manner, and allowed to fall into gear with the latter upon the speed of the engine being slackened, or the train stopped.

In applying the invention to a carriage for common roads, in which the axles do not rotate, “ the ratchet barrels must be “ adapted to the naves of the wheels.” And the pawls may be so employed as not only to check the progress of such carriage in going down hill, but also to lock the wheels of the carriage when standing still, and “ effectually prevent the “ horses from running away.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 17.—No. 2321.

LEE, JOSEPH, and TAPLIN, BENJAMIN DUTTON.—Traction engines. In front of the fire box end of the boiler is placed the driving and steering platform. The crank shaft is placed above the boiler and over the axle of the driving wheels. The engines are attached to the smoke box. Fast and loose pinions of differing size are fitted to the crank shaft and these pinions may be brought into gear with corresponding pinions on the driving axle. Each of the leading wheels is mounted on a pin or short axle which in turned are attached to vertical axes. A vertical shaft controlled by a hand wheel suffices to adjust the position of these vertical axes and wheels. The framing carrying the leading wheels has also a screw worked by hand for the purpose of adjusting the level of the boiler on hills.

[*Printed, 1s. 7d. Drawings.*]

A.D. 1861, September 21.—No. 2365.

STABLEFORD, WILLIAM.—Wheels. This invention is intended to apply chiefly to railway wheels, but may also be applied for common road purposes. The nave has connected to it a metal disc, or series of segments or spokes, bent down at the outer edge so as to form a hook, which may either be continuous or occupy certain parts of the circumference only. The tire is furnished with an inner web, this likewise being formed either all round or at intervals only in a hook. The hooked parts of the disc or segments and of the web of the tire are then put together so as to “interlock and form a “tight connection” between the two, there being “by preference” wood placed, with the grain proceeding radially, so as to bear against shoulders on the tire at one end and against the nave at the other or against such nave; bearing directly against the nave it may be received in sockets free to move on such nave. This wood is placed on both sides of the disc or segments, and the whole secured together by bolts, there being by preference placed on each side of the wheel a skeleton frame and ring, the bolts passing through these rings as well as through the other parts. Instead of wood, discs, segments, or spokes of metal may be used.

The patentee mentions that the wood (or if metal is used, metal instead of wood) should be so arranged on each side of the internal disc segments or spokes so as to form “an angle “between the tyre and the nave,” this arrangement affording the means of tightening the tire when necessary “by causing “the wooden or outer metal surfaces to approach more or “less a straight line that is, bringing them nearer together “at the ends where they rest on the nave, or in the sockets “upon the nave.”

Different modes of carrying out the invention are described.

[*Printed, 2s. 3d. Drawings.*]

A.D. 1861, September 23.—No. 2369.

DULEY, JAMES HENRY.—“An improvement in the manufacture of axle-boxes and bushes.”

This invention consists “in casting the axle-boxes and “bushes for the wheels of carts, waggons, agricultural

“ implements, and other carriages in jointed metal moulds  
 “ (in lieu of sand), by which means the inner and outer  
 “ surfaces of such castings are chilled and hardened, and the  
 “ strength and durability of the article greatly increased.”

A mould is described as being suitable for the purposes of the invention, in which a back and a front block are fixed upon a bed plate, a tubular core pin being used to form a passage through the axle box, such core pin consisting of a coating of loam placed round its middle, by which means an oil chamber is also produced in such box. The metal may either be run into the mould through a sand runner or otherwise, and the tubular core pin is furnished with perforations through which any air or steam that may be driven off from the loam coating will escape.

[*Printed, 6d. Drawing.*]

A.D. 1861, September 23.—No. 2374.

IANKOWSKI, VINCENT. — (*Provisional protection only.*)—  
 “ Improvements in carriages.”

“ The objects of the improvements is to obtain an agreeable  
 “ rising and falling or undulatory or wave motion to car-  
 “ riages, adapted particularly for the use of children or  
 “ invalids. For this purpose the supporting axle or axles  
 “ are fixed to wheels, and are formed with cranks or eccentrics  
 “ where they support the body of the vehicle, so that as the  
 “ wheels rotate by the movement of the carriage, the body  
 “ will be alternately raised and lowered, producing an un-  
 “ dulatory or wave effect, and this motion will be rendered  
 “ more agreeable by the application of springs. The wheels  
 “ may be arranged only to be fixed to the axles when  
 “ required, so that when this undulatory effect is not needed  
 “ the wheels may run freely on the axles as with ordinary  
 “ vehicles. For three or four wheel carriages the separate  
 “ axles may be connected, so that their respective cranks may  
 “ be governed to correspond in time for their rising and falling  
 “ motion, if desired. A carriage thus constructed may carry  
 “ a rocking horse or other model in place of a carriage  
 “ body.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, September 25.—No. 2393.

CRANE, WILLIAM THOMAS and ELLIS, THOMAS JOSEPH.—(*Provisional protection only.*)—Applying brakes to four-wheeled carriages. The following is the inventor's provisional specification :—

“ In checking horses, the effect is to raise the fore end and  
“ depress the rear end of the pole or shafts, and we take ad-  
“ vantage of this movement to apply breaks to the hind  
“ wheels. Our invention consists in fitting a cranked lever  
“ or levers to the fore carriage or other convenient part, one  
“ arm of which lever bears against the rear end of the pole or  
“ shafts, and in connecting the other arm by means of a rod,  
“ rods, or chains to a disc or crank connected also to a bar  
“ carrying break blocks. The action upon the checking of  
“ the horse or horses is to depress one arm of the lever and  
“ bring forward the other, which acting through the connec-  
“ tions, brings the break blocks on the hind wheels ; a spring  
“ releases the blocks, and restores or allows of the cranked  
“ lever resuming its position as soon as the pole or shafts  
“ resume their ordinary position.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, October 23.—No. 2655.

MARSHALL, JOHN.—(*Provisional protection only.*)—Traction engines and wheels. The pinion which gears with the inside rack on the driving wheels is mounted so as to work up and down in horn plates, and so allow for the action of the springs. The boxes of the driving axles also slide in horn plates or other guides, curved with a radius equal to the distance of the driving pinion from the centre of the driving wheel. By this contrivance the inventor claims that when the engine is started the load on the wheel is transferred from the centre of the wheel towards the circumference “ to a distance equal to the  
“ horizontal distance between the centre of the driving wheel  
“ and the driving pinion, by which the wheel is compelled to  
“ roll forward with a power equal to the weight of the engine  
“ acting upon a lever whose length is equal to the horizontal  
“ distance between the centre of the wheel and the pinion.”

When carriages are drawn by a traction engine, the inventor proposes to fit racks inside their wheels, with which racks

pinions, driven by a central shaft from the engine, are to gear.

The inventor also proposes to fit a rib or rail inside the felloes of a wheel, and then to fit to the axle a frame with two arms, to each of which grooved rollers, running on the rib or rail, are secured. One roller bears on the after part of the wheel at about a point horizontally in line with the axis; the other bears at a lower point in the fore part of the wheel. Thus, says the inventor, "a portion of the weight is (by the forward pull in drawing the carriage) thrown in advance of the line of direct pressure of the wheel upon the ground."

[*Printed, 3d. No Drawings.*]

A.D. 1861, October 25.—No. 2668.

WHARTON, WILLIAM.—Springs. In order to construct one of his improved springs, the patentee says:—"I first take a bed plate of suitable material of the full length of the spring required, its ends being turned into a solid or rolled eye or loop suitable for the ordinary attachments. I take a second plate, which overlaps or turns downwards, enclosing the edge of the bed or bottom plate, and upwards to receive and enfold the edges of the upper or third plate, forming a T edge on both sides of the plate. All the additional plates used in making this spring are fitted consecutively, as just explained, or in the same manner; the length of each of the plates used in making the spring is governed by the ordinary calculations."

[*Printed, 9d. Drawing.*]

A.D. 1861, October 25.—No. 2680.

LA MOTHE, BERNARD JOACHIM.—"Improvements in the construction of metallic railroad cars and other vehicles."

This invention consists in the employment of metallic bands and tubes for forming the ribs or framework of railroad cars, carriages, or other vehicles, whereby great strength and lightness are obtained, the cost of construction being also lessened in consequence of the facility with which the parts may be attached together, this being effected by binding the parts together without employing rivets or bolts or perforating such parts, and so weakening the latter. Different modes of carry-



ing out the invention are set forth, in some cases longitudinal pipes being combined with vertical ribs, such pipes and ribs being connected by means of "clasps," which may be attached either in a hot or cold state. Instead of pipes, flat bands of metal may in some cases be used. Where clasps cannot conveniently be used, plates may be employed, such plates being connected by rivets. The doors of the car are composed of a framework of bent pipes connected with ribs by means of bands, and the panelling of the doors as well as the sides of the vehicle is composed of sheet metal, "made more or less ornamental by ribs, panels, or other devices pressed in the same, which increase the beauty and tend to keep the sheet metal straight and stiff." The windows may be formed in any convenient manner, but the patentee prefers to use "a metal frame surrounding the glass, and sliding on a metal rib connected to the sides of the tubes forming the transverse ribs" of the vehicle. The inside of the car may be floored and fitted up in accordance with the use to which the car is to be applied, and may be divided into suitable compartments, a passage if needful extending from one end of the vehicle to the other, the roof over this passage being raised in such a manner as to leave a space either for ventilation or the introduction of light. "For freight cars a lining of wood should be employed to take any wear," and passenger cars are each provided with a water-closet for the convenience of travellers.

[*Printed, 10d. Drawing.*]

A.D. 1861, November 2.—No. 2760.

LOCKIE, THOMAS.—Wrought iron wheels. This invention relates more particularly to the uniting of the inner end or heads of the spokes of wrought iron wheels and the forming of the boss. "According to one modification," "the heads of the spokes are shaped of the usual segmental form in face view, but they are formed of the full depth of the boss, and the middle portion is, as it were, removed so as to impart a fork shape in side view. Instead of the two external rings or washers usually welded upon the outsides of the spoke heads, a single ring or washer is used, which occupies the fork spaces formed in the spoke heads. The spokes being arranged upon this central ring, the parts may

“ be welded together at a single heat, the spokes being  
“ thereby united to each other and to the central ring, and  
“ thus forming a solid boss. The central ring is by preference formed with a recess or hollow on one or both faces,  
“ and the welding action forces the corresponding parts of  
“ the spoke heads into the same, and the parts are thereby  
“ firmly locked together.

“ In some cases an inclination or graduation may be given  
“ to the sides of the spoke heads, so that in welding the  
“ pressure may act more effectively on the junction surfaces  
“ between the spokes.”

[*Printed, 6d. Drawing.*]

A.D. 1861, November 4.—No. 2771.

ASHLEY, JOHN.—Shafts for carriages. According to this invention, “ very short shafts are used, coming only to the  
“ horse’s waist or middle, and requiring the pad to be placed  
“ on the lowest part of the horse’s back. The effect of these  
“ is to enable the horse to set more round to its work in turning, having no shaft, obstructing it at the blade bone, and  
“ to step round accordingly with greater freedom and facility,  
“ and to turn in a smaller space, as well as with more ease  
“ and rapidity. These shafts are constructed without stops,  
“ their forward ends being bent somewhat downwards and  
“ outwards, and with fixtures on the fore side of the back  
“ band tugs to receive the belly band. By the application of  
“ two pairs of the improved safety shafts instead of a pole to a  
“ pair horse carriage, and arranging the harness as described,  
“ all the difficulty and wear and tear of the horses consequent on the use of a pole are avoided, as the horse will be  
“ relieved from the strain on the withers which is occasioned  
“ by the pole being connected to the collar, and by which he  
“ holds back the whole weight of the carriage when stooping,  
“ or when going down hill. The carriage may also be turned  
“ with ease and safety in a much smaller space than can possibly be done when a pole is used.

“ The outer shafts in double harness are the same as the  
“ shafts used for single harness; the inner shafts are fitted  
“ with a coupling strap immediately before the breeching  
“ fixtures. Besides the coupling strap, the inner shafts are  
“ armed each with a guard or fender. This consists of a

“ piece of iron from an inch to an inch and a half in width.  
“ It is firmly attached to the shaft on the outside, or that side  
“ which comes next to the adjacent shaft, and should present  
“ a flat surface to that shaft.”

[*Printed, 9d. Drawing.*]

A.D. 1861, November 12.—No. 2838.

COOKE, WILLIAM.—(*Provisional protection only.*)—Improvements in the construction of carriages, and in the means of ventilating the same. The inventor says:—“ One portion of  
“ my invention consists in the constructing a carriage of a  
“ form similar in outward appearance to what may be described as a double Hansom cab, but so constructed that  
“ whilst from its lightness of structure it runs on two wheels  
“ and may be drawn by one horse, four persons may ride in  
“ it with every degree of comfort and safety. In the centre  
“ of the said carriage, and in manner most convenient, I  
“ place a suitable partition in which may be a window to draw  
“ up and down, on each side of which partition I provide a  
“ seat. I also provide to the said carriages two separate  
“ entrances, namely, back and front. I also affix sliding  
“ windows with suitable apparatus for regulating the same in  
“ position immediately over the axletree, and in the roof I  
“ provide a convenient seat for the driver, together with a  
“ box for his legs, the said box enters the carriage to a convenient distance without incommoding the passengers. I  
“ also provide at the bottom and sides suitable springs and  
“ everything necessary to support, secure, or fasten the same.  
“ The axletree I place higher than the seats of the carriage,  
“ and the shafts I securely fasten to the carriage.

“ Another portion of my invention consists in the adaptation and application to carriage or other windows, or such  
“ like openings of wire gauze or other perforated material, so  
“ arranged as to form a series of folds extending and contracting at pleasure for the purpose of allowing the vitiated  
“ air to pass off at the same time that it admits the pure air,  
“ and excludes draughts or dust, the folds being so arranged  
“ that they rise and fall with the raising and lowering of the  
“ window, and are closely folded at the top of the window or  
“ opening when not in action.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, November 15.—No. 2874.

MINCHIN, CHARLES HENRY.—(*Provisional protection only.*)  
—Ventilators. “At the top of the aperture for the window sash, and behind the grooves in which the said sash slides,” the inventor places “one or more strips of wire or silk gauze, “jointed together so that they can be folded or opened out, “the top strip being held by pivots working in bearings fixed “to the frame. The bottom strip of gauze is mounted with “a bevilled strip of wood or other material, to which the top “of the sash is made to correspond, and the strips are made “to unfold or expand by means of weights or pulleys. At “each or either end of the lower strip or parts connected “with it, there is a cord or chain passing over a guide pulley “at the top, between other guide pulleys in the frame, and “fastened to the lower part of the sash or to weights and rods, “or levers are employed for the same purpose. When the “sash is placed in its lowest position, the strips of gauze are “closely folded together to allow the aperture to be of the “largest dimensions, but as the sash is being raised the “strips gradually unfold until they meet the sash and cause “the bevilled edges of the sash and bottom strip of the folds “to be in contact. As the sash is still further raised, it lifts “the strips, closing them one after the other, by which means “any amount of ventilation can be obtained.

“In order to procure the required friction for the proper “sliding of the sash,” the inventor employs “tubing of india- “rubber or other material in contact with plates of metal or “other suitable contrivance.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, November 19.—No. 2904.

LEE, JESSE.—(*Provisional protection only.*)—Constructing and adapting wheels to traction engines. “This invention consists, first, in adapting transverse bars of metal to the “felloes of the wheels of traction engines to ensure greater “hold of said wheels in the said ground than heretofore; “secondly, in connecting together at will two of such said “wheels placed at opposite sides of the engine, or only connecting one of the said wheels with the spur wheel of the “engine so as to be driven thereby; this may be effected by

“ placing each wheel loosely upon the axle on which the afore-  
“ said spur wheel is fixed, and by means of a lever wheel and  
“ clutch box fixing one or both of said wheels on the axle, or  
“ releasing therefrom as desired ; thirdly, in adapting a broad  
“ wheel to the fire-box end of the boiler of a traction engine,  
“ said wheel being constructed of two narrow felloes con-  
“ nected together by transverse bars or plates of metal ; this  
“ wheel is mounted loosely upon an axle on which is fixed a  
“ spur wheel driven by the engine, a lever wheel and clutch  
“ is also employed for fixing said wheel on the axle, so as to  
“ be moved thereby as desired, or instead of constructing the  
“ aforesaid broad wheel as lastly above described, it may be  
“ formed of two hollow cylinders, around which are formed  
“ projections ; these cylinders may either be coupled together  
“ or separately with the driving spur wheel before mentioned,  
“ or be entirely freed therefrom by means of a lever handle  
“ and clutch as before described with reference to the second  
“ part of this invention.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, November 22.—No. 2929.

MEYER, HERRMANN CHRISTIAN.—(*Provisional protection only.*)  
—Brake. The inventor says, in the first place, “ I use the  
“ weight of the carriages or their motive power, as break  
“ power ; to which end I shift or turn the axles or bearings,  
“ and use eccentric axles or eccentric bearings, or lower or  
“ raise the bearings by any other motion, or reverse the  
“ eccentric axles or eccentric bearings generally, thus forcing  
“ the wheels towards a break fixed on the body of a carriage ;  
“ or I lower the body of carriage (with fixed stay and breaks)  
“ on to the rails or roadway.”

Each stopper or pall is raised by means of a lever or other  
suitable mechanism, “ the levers to be connected by connect-  
“ ing rods and chain couplings to friction gear on the driving  
“ axle of the locomotive or engine (the friction gear to be  
“ double acting for both the forward and backward motion of  
“ the engine) ; the friction gear to have a hand lever within  
“ reach of the driver or person in charge of the break ; when  
“ the hand lever is moved it will act so as to wind up a chain  
“ connected to the levers, and so liberate the eccentric bear-

“ ings, when the latter will make a partial turn, and so lower  
“ the breaks which are fixed under the frame of the carriage  
“ but above the wheels on to the wheels; or the breaks may  
“ be fixed before or behind the wheels (as stays) of such length  
“ that they will reach to a short distance of the rails; and, in  
“ this case, by liberating the bearings, which will turn by  
“ the weight of the carriage, the latter will sink on to the  
“ rails or road, and the wheels will then clear the rails or  
“ road, the eccentric bearing being made to give a greater  
“ throw than the distance of the said stays from the rails or  
“ road.”

In order “ to set the train in motion again, there is fixed on  
“ the eccentric bearings a lever connected by connecting rods  
“ and coupling chains to a second double-acting friction gear  
“ drum, with hand lever within reach of the driver or person  
“ in charge of the break, by moving which lever the drum  
“ will revolve and wind up the loose chain, and so with the  
“ power of the engine or animal power turn all the eccentric  
“ bearings into their proper positions. The moveable stopper  
“ drops, and the carriages will proceed.”

In common road carriages, “ the application of the eccentric  
“ bearing or eccentric axles will cause the axle itself to make  
“ a partial turn when break power is to be applied, although  
“ the axle will as usual remain fixed when the carriage is in  
“ progress.”

The inventor states that “ various motions may be applied,  
“ which will have the same effect as eccentric bearings or  
“ eccentric axles.”

[*Printed, 3d. No Drawings.*]

A.D. 1861, November 23.—No. 2948.

BRAY, WILLIAM.—Traction engine. This engine is claimed to be particularly applicable to agricultural purposes, but it may also be used on common roads. The whole of the machinery, with the boilers, is carried by the driving wheels. These are attached to axles running in a hollow axletree. The axles are cranked where they take the wheels so that by turning the axle partly round, by means of gearing the position of the wheel in relation to the carriage may be varied. Each wheel is driven by means of a driver acting on a ring on the wheel

or on the spokes, indeed various methods of communicating the driving power are described. The hinder part of the framing is hinged to the part above described, and has one wheel. The engine is steered from the front, and the driving wheels perform the duty. By this arrangement dished wheels may be used, or those comprised by the inventor's patent of 13th December 1856, No. 3102, and when these latter are used the teeth or blades in one wheel may be advanced while the other wheel remains stationary. The use of the means of varying the positions of the wheels is claimed to be useful especially in enabling one wheel to run in a furrow without affecting the level of the engine. A waggon body may be attached to the hinged or locking plate, if necessary.

[*Printed, 8d. Drawing.*]

A.D. 1861, December 4.—No. 3045.

PULLAN, ABRAHAM, and LAKE, WILLIAM.—(*Provisional protection only.*)—Traction engines. This invention relates to a large number of improvements. They consist in a method of connecting the wheels to the engine by universal or spring joints; a method of keeping gearing together by springs; certain modifications of the invention patented by the first named inventor and Richard Longstaff, on 14th July 1859, No. 1670, relating to the use of an additional wheel to be brought into bearing when necessary; the attachment of teeth or grippers and spring teeth or pins to wheels to increase adhesion; fitting similar teeth to wheels running in portable railways; applying teeth on axes moving on the side surfaces of driving wheels, and actuated by eccentric rods; the use of a clip driving drum and of wire ropes with projections thereon to run in suitably shaped wheels; in a method of driving the engine by pitch chains, which may be taken up or tightened and by means of which varying speeds may be obtained; fire boxes and boilers constructed to permit uncovering of the heated plates on inclines; arranging the steering gear so as to permit one wheel if necessary to rise higher than the other in case of inequalities of the ground, and in various forms of engines for traction engine purposes.

[*Printed, 4d. No Drawings.*]

A.D. 1861, December 21.—No. 3211.

**SELBY, FRASER.**—"Improvements in boilers for the generation of steam in engines, for applying steam for motive power purposes, and in wheels and ways for steam carriages to run on."

Part of this invention relates to the construction of boilers and cylinders. "The third part relates to the transmission of motion from the crank axle to the driving axle, where gearing is used specially applicable to paddle wheel steamers traction and locomotive engines. The driving axle being much subject to vibration is made into two shafts, that is, is divided in the centre, the inner ends are hung on swivel or ball bearings, whereby the shaft is allowed to move in one direction, both up and down, the guard wheels hang over the centre of these bearings, and being geared into a pinion or wheel on the crank axle can never get out of gear or cross the teeth, one fitting into the other, the face of the wheels being convex and concave according to the radius taken from the swivel bearings and the diameter of the wheels. The other ends of these half shafts are fixed as is usual and kept in their places by springs. The fourth part relates to the wheels of locomotive and traction engines, and the tramway for them to run on. The rim of the wheel is made an inverted V-shape, with or without flat side rims, so as to run on a tramway or not. The rails are in the form of tubes, wrought or cast iron, or of a half circle, by which means the engine will gain more tractive power than with ordinary flat rails. Where no tramways are used" the patentee fixes "a flange on both or either side of the wheel, which may be called a flange wheel of smaller diameter than the other part of the rim, so that when the engine runs over soft ground, it will bear on the flanges, as well as on the wheels."

And lastly he fixes "on the rim of the wheel, at convenient distances apart, plates in the form of horse shoes to give greater power to the forward motion of the engine," and thereby prevent slipping.

[*Printed, 2s. 2d. Drawings.*]

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1862.

A.D. 1862, January 1.—No. 10.

BUSH, WILLIAM.—(*Provisional protection only*).—"Improve-  
ments in omnibuses and other carriages."

This invention relates firstly to the construction of an omnibus capable of being extended or drawn out, the hind part from the front, thereby affording more space for passengers. The invention applies also to "vans and other long-bodied carriages."

Secondly, it consists, says the inventor, "in constructing trucks and carriages in such manner that they may be used on rail or tramways and on common roads. For this purpose I fit a plate or plates under the fore part of the truck or carriage free to turn upon a pivot, and I connect the front axle and wheels to this plate. If travelling upon a rail or tramway, I bolt the plate so as to prevent it moving, but when the carriage is to run upon ordinary roads, I release the bolts, when the plate and 'fore carriage' are free to move about the pivot, and thus allow of the whole carriage turning. The wheels are such as will travel upon rails or trams, as well as upon common roads."

[*Printed, 4d. No Drawings.*]

A.D. 1862, January 10.—No. 73.

WIGZEL, MONTAGUE.—Ventilator. This ventilator "consists of two chambers or vessels, with or without inner shutters for directing or dispersing the air, and for preventing the rain from entering the carriage or compartment, and it has an external opening in each chamber, so that the fresh air is admitted through one external opening into the inner space or spaces in the apparatus, and then into the carriage, room, or other compartment, to which it may be applied, and the hot and impure air is made to pass out from the carriage or other compartment, through the other chamber or space in the ventilator, and is assisted in its outward passage by the suction caused by the apparatus passing through the air or by the air rushing past the opening through which the hot or impure air

“ passes out from the carriage or other compartment to which  
“ the ventilator is affixed.”

[*Printed, 6d. Drawing.*]

A.D. 1862, January 24.—No. 186.

ROCK, JAMES.—(*Provisional protection only.*)—“Improvements  
“ in common road carriages.”

The inventor in describing his invention says it “ consists,  
“ first, in making a carriage with a moveable close or coach  
“ head, interchangeable with two half heads similar to those  
“ of a landau. I make the coach head in the same way as  
“ that of the dioropha carriage patented by me, 9th November  
“ 1850, No. 13,328, and the landau half heads I construct in  
“ the same way as the barouche head of the said dioropha, so  
“ far as regards the framing, strengthening, and fastening of  
“ the parts which meet and rest upon the lower body of the  
“ carriage at the elbow line.

“ Second, in addition to the coach head, and the landau  
“ heads above described, I sometimes make a third head of  
“ the kind usually made to a barouche, which head may be  
“ used in lieu of the other two, and I also make a folding flap  
“ or flaps to the body to the front seat and doorway, also in  
“ the same way as a barouche.

“ Third, in some cases I use the hinder half of the landau  
“ head, instead of a barouche head, in conjunction with the  
“ flap; when I so use the half landau head, I sometimes add  
“ a moveable side piece which may be either of panel leather,  
“ or glass in suitable framing, and which may also be made  
“ to turn back on hinges or joints, and serve as a wing or  
“ mud guard.

“ Fourth, in order to give more light to the interior of the  
“ landau head, I make side lights in some or all of the four  
“ ‘ quarters.’ ”

“ Fifth, in order to avoid the notch which usually appears  
“ in a landau head at the junction of the standing pillar when  
“ thrown open, I make the standing pillar with a projection  
“ and cut away a corresponding portion of the door pillar;  
“ I then carry the pillar joint as near as possible to the inner  
“ edge of the door pillar, and I make such pillar joint either  
“ with a knuckle the whole breadth of the pillar, and  
“ sufficiently large to allow of the groove necessary for the

“ glass frame or blind to work in to be fitted or otherwise cut  
“ out of it, without cutting into the rivet or centre pin. Or I  
“ make the joint only of the breadth of the groove or grooves,  
“ and carry the pillar down at each side of it to form the  
“ rebates which confine the glass or blind. I strengthen  
“ these portions of the pillar which must necessarily be thin  
“ with metal if required.

“ Sixth, my invention relates also to the formation of the  
“ various parts of carriages called transom beds, spring beds,  
“ horn bars, futchels, splinter bars, pump handles, perches,  
“ and axle tree beds of plate iron or steel, cut out or forged  
“ to such shapes as when bent to enclose or partly enclose a  
“ hollow, will form such beds and other parts of the usual  
“ or any required shape with some parts larger than others,  
“ as necessary for use as bearings and otherwise or for  
“ symmetry.”

*[Printed, 4d. No Drawings.]*

A.D. 1862, January 28.—No. 223.

MORGAN, GEORGE HENRY, and MORGAN, EDWARD.—Carriage hoods. The peculiarity of this invention “ consists in  
“ arranging the apparatus by which the head of a carriage is  
“ opened and closed in such a manner that the coachman or  
“ other person on the driving seat may, by pressing a lever or  
“ suitable instrument, cause the head or the parts of the head  
“ of a carriage to open and shut; or in place of acting on the  
“ apparatus in front, it may be arranged to be acted on at the  
“ back or other part of a carriage. For these purposes it  
“ is preferred when the head of the carriage is in two parts,  
“ one at the front and the other at the back, that each [part  
“ should be acted on in the following manner:—The head  
“ joints in place of being outside of the head are placed inside,  
“ and are hid by the lining. Below the front and back seat  
“ an axis is applied having two projecting arms, to each of  
“ which is attached one end of a crank lever, and to the other  
“ end of such lever is attached a connecting rod, the upper  
“ end of which connecting rod is attached by a pin joint to  
“ one of the head joints, so that when the axis is caused to  
“ make a partial rotation the two connecting rods attached to  
“ its two arms will be moved up or down, and act on the head  
“ joints in such manner as to close or open the two parts of

“ the head. The two axes have each a third projecting arm  
 “ formed thereon, and those two arms are connected to each  
 “ other by a connecting rod and by pin joints, and the end of  
 “ this connecting rod is attached by a pin joint to an arm on  
 “ an axis under the driving seat, and this axis may be made  
 “ to turn partly round by a lever or proper instrument applied  
 “ thereto. When it is desired that one of the two parts of the  
 “ head of a carriage shall be capable of being opened or closed  
 “ separate from the other, provision is made for acting on the  
 “ front and back parts of the head separately. Where two  
 “ head joints are used on each side of the front or back part  
 “ of the head of a carriage, then suitable connection is made  
 “ between such two head joints and the axis below that the  
 “ movement of such axis may act on the two head joints on  
 “ each side. If a carriage has only one moveable or folding  
 “ head, then the apparatus above explained will be modified  
 “ accordingly.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1862, January 31.—No. 258.

DODGE, JOHN.—(*Provisional protection only.*)—Springs. The following is the provisional specification:—“ The object of my  
 “ invention is to ensure the axles of carriages, in which  
 “ C-springs are used without a perch, being retained in their  
 “ proper position, and thereby to prevent the irregular running  
 “ or wobbling of the wheels.

“ My invention consists in applying two parallel rods by  
 “ means of a clip on the axle, and through a brace or braces  
 “ to the free end of the C-spring; the opposite ends of the  
 “ parallel rods may be attached to the body of the carriage,  
 “ or may be otherwise attached.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, February 1.—No. 273.

HILL, JOHN.—Perambulators, &c. This invention consists in a method of framing or constructing folding perambulators, invalid carriages, ambulances, &c. The inventor thus describes the construction of a perambulator on his plan:—  
 “ The bottom part of the back of the perambulator is hinged  
 “ to the framework of the seat. The propellers or handles are

“ also hinged to the top of the back, so that when not in use  
 “ they hang at the back of the perambulator, and attached to  
 “ such propellers or handles just above such joints are hinged  
 “ or jointed two rods or pistons by means of bolts, one to each  
 “ propeller or handle. The other end of such rods or pistons  
 “ is hinged or jointed to the end of the side pieces or elbow  
 “ rests which project a little beyond the back of the peram-  
 “ bulator, such rests being also hinged to the side pieces of  
 “ the back by bolts on which they turn. The front pieces  
 “ which support the foot rest and front wheel are hinged to  
 “ the front ends of the two side pieces or elbow rests, and  
 “ also to the framework under the seat by knuckle joints, and  
 “ when open for use being held in position by means of the  
 “ knuckle joints. Also a lifting seat, which when shut down  
 “ on a spring catch or other similar contrivance, renders the  
 “ knuckle joints and other parts rigid (or a jointed stay may  
 “ be used for the same purpose, fixed on one or both sides),  
 “ and when required to be shut, it is done in the following  
 “ manner:—By pressing down the handle after releasing the  
 “ catch, the two rods or pistons press down the end of the  
 “ side pieces or elbow rests to which they are attached, which  
 “ brings the front end of such side pieces or elbow rests close  
 “ up to the back of the perambulator, and draws up with it  
 “ the seat and front piece which carries the foot rest and front  
 “ wheel between the two hind wheels.”

[*Printed, 10d. Drawing.*]

A.D. 1862, February 18.—No. 433.

BUSH, WILLIAM.—(*Provisional protection only.*)—“Improve-  
 “ ments in omnibuses and carriages.”

The invention consists firstly in the construction of telescopic  
 omnibuses, the hinder part being capable of being drawn out  
 or lengthened so as to contain more passengers. The principle  
 is applied also to “vans and other long-bodied carriages.”  
 The invention also consists “in constructing the frames for  
 “ omnibuses, trucks, and other carriages of angle-iron and in  
 “ screwing, bolting, or rivetting to the angle-iron for forming  
 “ parts of the framing two other angle-irons with timber  
 “ fixed between the two last named angle-irons, to which  
 “ timber the panels and other required parts to complete

“ the carriage are screwed or otherwise secured. Thus the  
“ whole of the framing and skeleton of the carriage are  
“ formed of angle-iron, and of two angle-irons with timber  
“ between them.”

It further “ consists in constructing trucks and carriages in  
“ such manner that they may be used on rail or tramways,  
“ and on common roads. For this purpose ” says the inventor “ I fit a plate or plates under the fore part of the truck or  
“ carriage free to turn upon a pivot, and I connect the front  
“ axle and wheels to this plate. If travelling upon a rail or  
“ tramway, I bolt the plate, so as to prevent it moving, but  
“ when the carriage is to run upon ordinary roads I release  
“ the bolts, when the plate and ‘ fore-carriage ’ are free to  
“ move about the pivot, and thus allow of the carriage turn-  
“ ing. The wheels are such as will travel upon rails or trams  
“ as well as upon common roads.”

*[Printed, 4d. No Drawings.]*

A.D. 1862, February 19.—No. 440.

ADAMS, WILLIAM BRIDGES.—Springs. In one part of this invention an “ abutment spring ” is formed of a straight bar of iron or steel, of which the ends are curved downwards and embrace the ends of the two bent springs, these being composed of plates of tempered steel fitted together, the whole being kept in their places by pins if necessary. When a spring of this description is applied to a carriage, the straight bar which acts as a tension bar, is bolted to the carriage frame, and the bent plates rest upon the axle box. Or instead of the tension bar a pair of abutments may be bolted to the carriage frame. In another modification of this part of the invention the spring plates are divided in the middle, and the lower ends thereof rest against a block of metal which may be mounted upon an axle box. The number of these plates may be varied, and instead of a straight tension plate, a curved plate may be used, which “ may elongate with the load,” being provided with slides or scrolls and shackles. According to another arrangement a saddle of iron or steel, having the ends turned up, is placed upon the axle or axle box, and employed to sustain the ends of curved plates, which act in connection with a tension bar. Such curved plates may be hooped together to strengthen the spring, and plates tapering

in width may be used for the same purpose. In one arrangement which is described, a certain block is fixed to the carriage frame "to prevent the springs from being overpowered by the load, or it may be placed in the axle box for the same purpose, the curves of the blocks where the springs touch corresponding to the increased curvature of the springs." Various other modifications of this part of the invention are described, and the invention includes certain modes of constructing wheels and tyres in which compound springs composed of steel rings or hoops, or segments with caoutchouc between them are placed between the wheel and the tire, thus giving to such wheels a degree of elasticity. Springs may be applied also to driving gear for the avoidance of shocks. For this purpose there are inserted in cylindrical chambers cut partly in the pinion and partly in the toothed tire, tubular steel springs. By this means the tire or geared part is capable of a slight motion, under strain, round the pinion itself.

[*Printed, 10d. Drawing.*]

A.D. 1862, February 21.—No. 465.

PICKIN, ROBERT, and PICKIN, WILLIAM EDWIN.—Carriage bodies. "Our invention" say the patentees "has for its object the manufacture of carriage bodies in such manner as to obtain strength and durability combined with lightness and convenience. For this purpose we take bars or rods of iron or other metal, which we bend where necessary, or otherwise shape and weld or unite where they meet in such manner as to constitute a framework. To these bars or rods we connect other rods or wires laid in pairs or otherwise, so as to produce what may be called a skeleton body. Over or under these rods or wires, or over or under some portions thereof, we attach plain or corrugated woven wire or wire network, which in some cases we solder or otherwise unite to the rods or wires where they come in contact to obtain increased strength, though this is not always needful. We recommend that the whole body when put together as described should be galvanized."

[*Printed, 8d. Drawing.*]

A.D. 1862, February 22.—No. 474.

MILLINGTON, JOHN.—Hearse. “The body of the hearse or  
“ bier consists of a platform or stage mounted on four wheels  
“ the sides of the said platform covering and concealing the  
“ upper parts of the wheels. The wheels are connected to  
“ the hearse by springs the axle of the front pair being  
“ capable of turning so as to give the required direction to  
“ the hearse’s motion. Three pairs of handles are situated  
“ on the sides of the hearse for the purpose of propelling it.  
“ The front pair of handles are connected with the moveable  
“ axle of the front wheels and the front bearers and atten-  
“ dants are thus enabled to direct the hearse with great facility.  
“ The back and middle pairs of handles are fixed on the sides  
“ of the hearse. A supplementary and removeable handle  
“ passing through the front of the hearse enables one per-  
“ son to move the hearse about when it is not in use, and  
“ whenever else it may be convenient or necessary for it to be  
“ moved by one person. The front pair of handles and the  
“ end handle pass through slots in the sides of the hearse,  
“ and are connected to the front axle as before described.  
“ The coffin is placed on the top of the hearse and is covered  
“ by a pall. Transverse ribs or bars of metal fixed on and  
“ raised slightly above the level of the platform, support the  
“ coffin and prevent it from rubbing and wearing the surface  
“ of the platform. The coffin may be fixed by straps which  
“ buckle to the sides of the hearse, and the pall may be  
“ fastened by elastic loops to the side of the hearse. The  
“ wheels may either be made of wood or of light tube iron,  
“ or of a combination of wood and iron.

“When the hearse or bier is to be drawn by horse power,  
“ a pair of shafts is substituted for the front removeable  
“ handles.”

[*Printed, 8d. Drawings.*]

A.D. 1862, March 10.—No. 639.

MASSI, CHARLES.—(*Provisional protection only.*)—“Improve-  
“ provements in means and apparatus for retarding and  
“ stopping carriages used on railways or common roads.”

According to this invention the brake blocks of railway



carriages are mounted in the usual manner, but to the outer end of each brake lever, or to another lever which may conveniently be made to act thereon, there is fixed a "keeper," and opposite to this is placed a horse-shoe magnet of soft iron, with a copper coil arranged thereon in the manner common to electro magnets, a galvanic battery being so arranged in connection with the wire that by the movement of one end of the latter, the soft iron horse-shoe may be magnetized, and the "keeper" connected with the brake apparatus be drawn towards it thus causing pressure of the brakes against the wheels of the carriage to which they belong. "It will be "obvious that as one of these magnets and brakes may be "applied to every wheel or pair of wheels of a carriage, "and the power of the battery can act instantaneously on as "many magnets as may be in contact with it, it will be "perfectly practicable to apply the apparatus to every carriage of a railway train however long and as instantaneously "remove the brake when not required," and for the purpose of "obtaining a longer pull than is usual with electro magnets" the keeper may be formed in "two or more parts, "one working inside the other," but the inventor states that he "can work the apparatus perfectly well by the means first "described."

[*Printed, 4d. No Drawings.*]

A.D. 1862, March 10.—No. 646.

BARCLAY, ANDREW. — Traction engines. The traction engine described in this specification has an ordinary locomotive boiler mounted on a rectangular framing. There are two driving wheels, each running loose on a fixed axle, and one trailing wheel fitted in the centre of the framing beneath the foot plate. Each driving wheel is driven by a pair of engines through a pinion gearing with an annular toothed wheel attached to the driving wheel or with a spur wheel attached to its nave. The steering of the engine is effected by turning the regulator handle in the direction the engine is intended to take; by this movement more strain is supplied to one pair of engines than to the other, and thus one wheel is driven faster than the other. The single trailing wheel may also be controlled by a screw and used as a steering

wheel. The periphery of the driving wheel has a number of polygonal holes in which are inserted little blocks of wood. These project slightly and in passing paved streets the wheel runs upon them and so sound is deadened. The invention also relates to a pressure guage.

[*Printed, 2s. 2d. Drawings.*]

A.D. 1862, March 21.—No. 784.

CURTIS, WILLIAM JOSEPH. — (*Provisional protection only.*)—Indicator for vehicles. The inventor proposes to connect the wheel with the indicator by means of an endless band. “Connected with the indicator may be a cylinder or box, containing a column of cards or tickets, which will move in exact agreement with the indicator, the movement of which stops when the carriage stops, which cards or tickets will be marked or nicked by a punch forming part of the machine in exact correspondence with the indicator, when presented by the conductor to the passenger entering, and may again be marked on leaving. The cards are then to be deposited in a box. According to another proposition, the indicator is placed under the seat, and the latter, being depressed by the weight of a passenger, brings a pencil in contact with a travelling band of paper.

[*Printed, 4d. No Drawings.*]

A.D. 1862, March 22.—No. 799.

GLADSTONE, ROBERTSON.—“Certain improvements in tilting or tipping waggons.”

“The first part relates to an improved form of axle by which the body of a waggon, either with or without springs, can be evenly balanced, and complete end tilting or tipping effected, and consists in bending or cranking the said axle immediately after it leaves the naves of the wheels, a sufficient length horizontally or angularly towards a vertical line drawn transversely through the centre of the waggon, so that when such waggon is completely tilted or tipped endwise, it will not come in contact with the longest part of the said axle which runs parallel to a line continued from one end bearing part to the other.

“The second part of the said invention is only applicable to

“ four-wheeled waggons with fore carriage, and consists in  
“ forming the connecting rod which is secured to or made  
“ part of the axle of the hind wheels by bending it upwards  
“ and forwards so that it will pass over the fore carriage, or  
“ carriage part,” and couple to the main pin or “perch bolt”  
of the same, thus allowing the said fore “carriage to turn on  
“ small surface.”

[*Printed, 8d. Drawing.*]

A.D. 1862, March 24.—No. 809.

CLARKE, JOHN.—(*Provisional protection only.*)—Axles. The following is the inventor's provisional specification:—"My  
“ invention relates to carriage axles of the kind known in  
“ commerce as Collinge axles, and consists in the arrangement  
“ or arrangements herein-after described for fixing upon the  
“ end of the arm of the axle the collet or washer against  
“ which the end of the axle box works. In the ordinary Col-  
“ linge axle, the collet or washer fits upon a part of the arm  
“ near its end, the said part being of smaller diameter than  
“ that on which the box works. The said collet is secured in  
“ its place by a screw nut working on a screw, and the said  
“ screw nut is maintained in its place by a second screw nut,  
“ the said second screw nut being prevented from unscrewing  
“ by a pin passed through a hole at the end of the arm. The  
“ several parts of the arm described are of progressively  
“ smaller diameter in the order in which they have been  
“ described. In my improvement or improvements I make  
“ but one screw, on the end of the arm, on which said screw  
“ a screw nut engages to hold the collet or washer up to its  
“ bearing against the end of the axle box, and the said screw  
“ nut is fixed in its place in the following manner:—A hole is  
“ drilled in the end of the arm, and in the axis thereof, which  
“ said hole is tapped or made into a concave screw, and in the  
“ said screwed hole a screwed pin having a fixed nut or  
“ hexagonal or other shaped head engages. By screwing  
“ the said screwed pin into the said screwed hole the head of  
“ the said pin is made to bear against the screw nut, and  
“ prevent it from unscrewing. I make the screw on the pin  
“ left handed, that on the outside of the end of the arm being  
“ right handed, or the pin may have a right-handed screw,

“ and the outside of the arm may have a left-handed screw.  
“ I make the said screwed pin by preference of steel, but I do  
“ not limit myself to the use of any particular material.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, April 4.—No. 951.

WOODALL, JOHN FRANCIS.—Ventilators. The patentee says,  
“ I form long narrow slits or apertures in the sides and over  
“ the doors, and in some cases also in front of carriages close  
“ to the roof of the same, and cover them on the outside with  
“ ornamental gratings through which the external air can  
“ pass into the interior of the carriage. On the inside these  
“ apertures are provided with flaps or valves hinged at the  
“ bottom and opening at the top so as to regulate at pleasure  
“ the quantity of external air admitted and to direct the  
“ currents upwards towards the roof. In or near the centre  
“ of the roof lining of the carriage I form a valvular opening  
“ also covered with ornamental scroll work and capable of  
“ being opened or closed at pleasure. This opening is con-  
“ nected with and conducts into a tube or passage fixed to the  
“ roof of the carriage and leading to the back of the same,  
“ where it communicates with the external atmosphere  
“ through a narrow slit which may be hidden or covered  
“ externally by means of a beading or ornamental shield or  
“ grating, or in any other suitable manner. The effect of this  
“ arrangement will be that when the carriage is in motion  
“ the fresh external air will pass into the carriage through  
“ the before-mentioned slits or apertures in the sides or front  
“ of the same, whilst at the same time the hot or impure air  
“ inside the carriage, and which is mostly situated at the top  
“ close to the roof will be partly drawn off by the motion of  
“ the carriage and partly driven off by the entrance of the  
“ fresh air into the before-mentioned valvular opening in the  
“ roof lining, and passing along the tube or passage com-  
“ municating with the same will escape into the external  
“ atmosphere through the before-mentioned narrow opening  
“ in the back of the carriage.”

[*Printed, 10d. Drawing.*]

A.D. 1862, April 10.—No. 1034.

BARTHOLOMEW, CHARLES, and HEPTINSTALL, JOHN.—Manufacturing tires. According to this invention a puddled bar of iron is cut into segments or radial pieces, the cuts being made “to slope alternately in either direction,” and the pieces when laid together making up “a complete polygonal ring.” A small bar of iron is then formed into a “flat coil,” and upon this a number of the radial pieces are laid in a circle, upon these other circles of such pieces, “breaking joint” with the first, and afterwards other circles in succession, each breaking joint with the other, until a pile is formed of sufficient thickness. Upon this a flat coil is laid, similar to that on the lower side, and the pile, with the coils, being placed in a suitable die, the whole are welded together by hammering. A punch is then struck through the bloom thus formed, consolidating the iron laterally, “and the whole is sufficiently “hammered for thorough consolidation.” A bloom may thus be formed from cast or blistered steel as well as from iron. Or a bloom may be composed of iron and steel combined together in various forms. Thus iron and steel bars may be cut into pieces of suitable form for being so arranged that the outer portion of the bloom or that next the circumference shall be of steel, and the inner portion of iron. Or a pile may be formed of a top and bottom coil of steel, with radial pieces of iron between the two, the pile being afterwards completed by enclosing it in a spiral coil of steel, and a bloom being thus obtained “having a thin coating of steel both “externally and top and bottom.” These blooms may all be rolled upon the system for which a Patent was granted to the present patentees on the 14th of May 1857, No. 1369.

[Printed, 10d. Drawing.]

A.D. 1862, April 14.—No. 1074.

BROOMAN, RICHARD ARCHIBALD. — (*A communication from Nicholas de Maklakoff.*) — Improvements in carriages. This invention consists essentially in the employment of a long cylindrical vessel, having hemispherical ends, there being passed lengthwise around this vessel endless chains composed of links of iron, and these chains being connected to the axes of a number of rollers which travel round the vessel during

its progress, those beneath it for the time being serving as wheels thereto. Around each outer side of the vessel is a rail against which the rollers work, and merchandise may be carried both inside the vessel and also by a carriage or cart mounted above it, the latter being also capable of accommodating passengers. When this apparatus is meant to travel on common roads, the rear end of the cylindrical vessel has an aperture formed in it for the reception of a lever, "to make as easy as possible the turning of the carriage," and for "going down inclines" certain racks are connected to the links of the chains, and made to operate upon a toothed wheel which is connected to a pulley, the latter being apparently meant to act as a break. The patentee mentions, however, that carriages constructed according to this invention may be provided with brakes and "all other accessories" usually adopted in carriages constructed in the ordinary manner. Different modifications of the invention may be made.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1862, April 16.—No. 1112.

JOHNSON, JOHN HENRY.—(*A communication from Claude Marie Bathias.*) — (*Provisional protection only.*) — Attaching wheels to carriages. "This invention relates to a peculiar mode of mounting railway and common road carriages upon their running wheels, and consists in mounting such vehicles upon wheels, rollers, or cylinders which rest at their peripheries upon the ordinary axles of the vehicle. The axles of the upper and lower wheels are by this system considerably reduced in diameter, and hence the friction is reduced and a considerable saving of tractive power is obtained. The upper wheels are mounted in forked guard irons, which take the entire weight of the load, suitable springs being adapted thereto. The axles of the upper and lower wheels may be allowed to work freely within slots or openings made in the forked guard irons, and in some cases one or both the lower wheels may be loose on their axle to facilitate turning or the passing over curves."

[*Printed, 4d. No Drawings.*]

A.D. 1862, April 23.—No. 1186.

BOUSFIELD, GEORGE TOMLINSON. — (*A communication from Jabez Marshall Woodward.*) — “Improvements in the construction of elliptic springs for wheel carriages and other purposes.”

The object of this invention is to obtain “a spring that will oppose a resistance to a superimposed weight, and that possesses great elasticity with a less weight of material than is required in the construction of the ordinary elliptic springs in general use.” In order to accomplish this result the arched leaves of the spring are combined with an arched spring tie bar of less curvature than the leaves with which it is connected, the ends of the longest leaf of the spring being connected to the ends of the arched tie bar. The straightening of the leaves of the spring by transverse pressure tends to straighten the tie bar by drawing it longitudinally, and the strength of the spring to resist transverse pressure increases rapidly with its flexure, the result being that “a less amount of material can be employed to form a spring possessing equal strength with an elliptic spring of the ordinary construction.”

The invention includes a mode of connecting the adjacent ends of the leaves and tie bar of a spring, which consists in combining the two by means of a head upon the tie bar having a shoulder against which the adjacent end of the longest leaf of the spring abuts.

The invention further includes a mode of connecting the adjacent ends of two tie bars and two sets of leaves, or that the whole forms a complete elliptic spring; this consisting in combining the adjacent heads of the tie bars against the shoulders of which the ends of the spring leaves abut, by means of a clasp which partially encircles the adjacent heads of the bars.

Another part of the invention relates to obtaining “great flexibility in the spring with light loads, combined with great resistance, to heavy pressures,” so that carriages to which such springs are applied will run easily whether lightly or heavily laden. This consists in “combining the spring leaves with the tie bar in such manner that the leaves will yield a certain distance to pressure before the strain is pro-

“ pagated to the tie bar to extend it longitudinally.” The end of the longest spring leaf is quilted, as well as the end of the tie bar, the opening in the latter being large enough to receive the exterior of the former, the same bolt securing both; or the ends of the longest spring leaves are quilted or thickened so as to form heads which are retained in position by a clasp.

[*Printed, 8d. Drawing.*]

A.D. 1862, April 24.—No. 1192.

HAGGETT, WILLIAM.—Brake.—The chief object of this invention is “ to increase the safety of railway trains travelling “ at high speeds, principally by providing a ready and effectual “ method of retarding their progress, or stopping them, as “ may be required. For this purpose there are attached to “ the axle boxes, or other fixed points on the framework of “ the locomotive engine or railway carriage, flanged friction “ blocks or brakes, which can be brought down upon the rails “ by a lever or other mechanical power, whereby the wheels “ will be lifted clear of the rails, and the whole weight thrown “ upon the flanged friction blocks or brakes, thus converting “ the engine or carriage into a sledge, by which means its “ progress will be retarded or stopped, as may be required. “ The levers or other apparatus employed to give motion to “ the friction blocks or brakes are also available as a medium “ of communication between the engine and the carriages,” and in order to prevent such engine and carriages from running off the rails “ guiding wheels are attached thereto, “ which guiding wheels remain in contact with the rails “ when the engine or carriage is lifted, as before described.” For carriages meant to travel on tram or common roads the friction blocks or brakes are without flanges. Various modes of carrying out the invention are described, the details of the invention including different arrangements of levers, connecting rods, rollers, chains, and other apparatus, through the medium of which the brake blocks may be forced downwards by the exercise of manual power. In carriages for common roads and tramways the blocks may be pressed downwards by the use of a “ footboard,” or by means of a screw or other suitable mechanism, one arrangement being described in which a “ drag or shoe ” is allowed to fall in



front of one of the wheels of the vehicle by releasing a strap or chain which at other times keeps it in a raised position.

[*Printed, 10d. Drawing.*]

A.D. 1862, April 24.—No. 1203.

OFFORD, JOSEPH.—(*Provisional protection only.*)—"Improve-  
ments in carriages."

The inventor says, "I improve the wheels by constructing the nave stock or centre part of wrought iron forged, whole bored and hardened so as to obviate the necessity for a separate axle box, and tapped so as to receive the spokes, which I also make of wrought iron or other metal, and screw into the nave. In forming the felloes or rim of the wheel, I introduce a laminated principle of construction, using wood, vulcanite, india-rubber, and iron or steel, or other suitable metal. I improve the steps and parts thereof by fitting to the bottom of the door, upon a dead pin, a radial bar or rod, jointed at the other end to a slide, made by preference of copper or zinc, and placed outside and under the carriage, and from this slide or second bar or radial rod jointed upon dead pins, or otherwise is attached a rising and falling step. This step is so constructed and fitted that the tread is considerably longer than the limb, so as to provide more space or length for the foot, the extra tread being let in between the door and the bottom side rail of the carriage floor, and made to rise and fall by the action of the radial rods as the door opens and closes. The step is thus improved and made self-acting and noiseless, and also acts, if necessary, as a stop to the door. To lessen the effects of concussion in the wheels, I propose to introduce a chemical combination of soft india-rubber, and vulcanite between the centre of the axlebox or iron nave and that portion of the nave which receives the spokes. This I effect by covering an ordinary cast-iron axlebox or a nave of wrought iron, as before described, or of other metal, with two layers of vulcanite separated by a layer of soft rubber, all chemically united in the process of manufacture. In the outer layer is imbedded a ring of wrought iron or other metal to receive the spokes."

[*Printed, 4d. No Drawings.*]

A.D. 1862, April 30.—No. 1277.

CARTER, JOHN MONEY.—Shafts. This invention relates to certain improvements in harness and in shafts of carriages. The shaft here described is made of tubular iron, in parts which “telescope” one within the other so that by means of set screws or clamps, the length of the shaft may be adjusted. The shaft is moreover shaped to the horse. It is capable of vertical motion to allow for the horses motion, but it is so attached to the carriage that horizontal movement serves to turn the carriage in the manner of a pole. The shaft hooks into an eye on the horse, so that traces are rendered unnecessary. There is also an opening, secured by a hinged or sliding catch, into which the tug is placed.

[*Printed, 8d. Drawing.*]

A.D. 1862, May 2.—No. 1296.

EVANS, ORMROD COFFEEN.—(*Provisional protection only.*)—Propelling velocipedes, carriages, &c. by means of “a reversible attachment . . . for converting reciprocating rectilinear into rotary motion.” “The attachment consists in affixing upon a shaft or arbor a smooth and level faced wheel, and on each side of this wheel so adjusting a bridle as that it clasps the shafts or arbor and also the journals of a roller which runs upon the face of the wheel. The bearings in the bridles for the shaft, instead of being round, are oblong, so as to leave an open space on each side of the shaft of half an inch, more or less, and have a curvature which in radius is equal to about one half the radius of the wheel. The bridles extend above the face of the wheel about twice its radius and are firmly fastened together above the roller so as to keep the roller in a fixed position across the face and at right angle with the sides of the wheel, and also to form the arm to which the power is applied. Now if this bridle arm is moved in one direction by a sudden force an axis of motion is established by impingement at the point where the roller happens to be in contact with the face of the wheel at the time the force is applied. From this axis the lower end of the bridles move across the sides of the wheel until the bearings impinge the shaft; these bearings being

“ eccentric to the axis of motion above described. By thus  
“ impinging the face of the wheel and the shaft the bridles  
“ become so affixed to the wheel and shaft as that they all  
“ move forward as one as far as the bridle arm is carried in  
“ that direction, and at the instant the stroke is spent the  
“ bridles are released and carried back to their former position  
“ by return stroke, and the shaft and wheel continue to move  
“ forward by the momentum thus imparted, according to the  
“ velocity of the force applied; but after the force of the  
“ stroke is spent the bridles cannot be carried back to their  
“ former position or the wheel continue its motion unless  
“ impingement of the bearings in the bridles upon the shaft  
“ is prevented at the return stroke. And for this purpose  
“ sliding stops (not unlike sliding bolts) are fastened to the  
“ bridles in a manner so that when pushed down, the bridles  
“ being in line with the shaft, they touch the shaft on either  
“ side. Now if the one on the side towards which the shaft  
“ is to revolve is pushed or lifted up, that side of the eccentric  
“ bearing is left free to impinge the shaft; and to reverse the  
“ motion, if the stop now up is pushed or drawn down and  
“ the other pushed or drawn up, impingement will take place  
“ in the opposite side of the bearing, and hence the shaft and  
“ wheel made to revolve by the same reciprocating force in  
“ the opposite direction. An important difference in the  
“ wear of some of the parts may be made by inserting rollers  
“ so arranged and supported in the bridles as that their  
“ surfaces will not only run upon the surface of the shaft  
“ while in motion, but will impinge its surface in like manner  
“ to the eccentric slot or bearing above described at each  
“ change of the bridles from a central position to the centre  
“ of the shaft. From this it may be seen that when the  
“ power applied is accomodating instead of arbitrary, as by  
“ the use of the hand or foot, or any mechanical force equally  
“ accomodating in its arrangement of application, a velocity  
“ may be attained by imparting velocity to velocity and  
“ momentum to momentum, as when applied to velocipedes,  
“ foot lathes, and even carts and carriages used for heavy  
“ burthens, or in any other place alike susceptible of use,  
“ which is not and in most such cannot be imparted by the  
“ use of the crank.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 3.—No. 1307.

JUHEL, HENRI.—(*A communication from Mathurin Rives.*)—Tyres. This invention consists “in substituting for the  
“ ordinary flat band an elbowed concave band of iron, steel,  
“ or any other metal for wheels of every description of car-  
“ riages. To this effect” the felloe is so shaped that it may  
“ receive the elbowed concave metallic band which clamps to  
“ the upper part of the said felly to which it adheres without  
“ having recourse to the heating of the said metallic band,  
“ thus avoiding the cination or carbonization of the wood,  
“ and the subsequent inconveniences that arise from the said  
“ cination or carbonization. This cold process besides  
“ allows the use of steel for bands, which steel has been  
“ hitherto rejected for the manufacture, as it loses by the  
“ heating process its primitive and peculiar qualities. The  
“ metallic band is made of one piece, and does not require to  
“ be fastened to the felly at more than two places, that is to  
“ say at both ends of the band. At the place of fastening the  
“ felly is strengthened by a piece of metal, through which  
“ passes a bolt, to be screwed at the internal part of the felly ;  
“ this strengthening piece is moreover fixed to the metallic  
“ band by means of rivets or bolts, and steel pins. The  
“ fastening might be made at different other places, where  
“ the felly is then strengthened by a similar process. The  
“ metallic band might be made of several pieces and if so it  
“ is fastened to the felly at every joint.” The fastening is  
effected by means of an apparatus which draws the ends  
together by means of a screw.

[*Printed, 6d. Drawing.*]

A.D. 1862, May 3.—No. 1316.

NEALL, GEORGE.—(*Provisional protection only.*)—Propelling  
vehicles. The following is this provisional specification :—

“ This invention consists of certain apparatus for obtaining  
“ and applying motive power, more particularly applicable to  
“ carriages on common roads or for general purposes where  
“ motive power is required. I propose to use a very long and  
“ powerful helical steel spring, wound up in a barrel and  
“ attached by suitable gearing to a driving wheel, either for

“ the purpose of working machinery or more especially for  
“ the purpose of propelling carriages on common roads.  
“ The spring will by its length and power exercise its influence  
“ a lengthened period, and when exhausted or nearly so  
“ it may be rewound, whereby in a small compass a motive  
“ power may be obtained and applied to various useful pur-  
“ poses.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 3.—No. 1318.

FOWLER, JOHN.—Hauling engines. This invention relates to the attachment to portable or traction engines, of hauling drums. The patentee says, “I so construct the engine that  
“ it may be used either for ordinary tilling or for drain  
“ ploughing, this I do by mounting underneath the boiler of  
“ the engine and between the fore and hind wheels two drums  
“ mounted on vertical axes, and so driven that one makes  
“ several revolutions for each revolution of the other, the two  
“ axes being geared the one to the other by spur wheels pro-  
“ perly proportioned. The fast running drum I prefer to  
“ have nipping instruments upon it, so that it may hold a  
“ hauling rope which passes only half round it. The slow  
“ running drum I prefer to be a winding drum, to wind or  
“ coil up the rope upon itself, but it may be a nipping drum  
“ very strongly made. In place of mounting both the fast  
“ and the slow drums so that they both remain permanently  
“ on the engine, I sometimes so arrange the apparatus that  
“ the fast running drum may be removed, and a slow running  
“ drum with its intermediate gear substituted therefor, the  
“ frame of the engine being accurately fitted and prepared to  
“ receive such parts.

“ The engine and apparatus are mounted on four wheels the  
“ fore pair of which are made to lock round, the axle of the  
“ hind wheels is fixed and the wheels turn loosely thereon ;  
“ and in lieu of an ordinary friction brake on one of these  
“ wheels a pulley is fixed at the extremity of the axle, and  
“ the wheel is made to carry round with it a brake band  
“ surrounding this pulley ; by drawing the ends of a strap  
“ together by a screw the movement of the engine can be  
“ impeded.”

[*Printed, 10d. Drawing.*]

A.D. 1862, May 7.—No. 1372.

MARCHAL, DÉSIÉ, and DE WIART, ADRIEN CARTON.—Preventing vibration or concussion. The inventors apply to wheels or axletrees tires or packings of “lead, tin, zinc, copper, or an alloy of these metals, or either of them” for the above purpose. Vibration in permanent way and machinery is to be similarly prevented.

[*Printed, 1s. Drawings.*]

A.D. 1862, May 10.—No. 1403.

CLARK, WILLIAM. — (*A communication from Jean Louis Abeilhou.*)—Preparation of vegetable fibre. The patentee proposes to utilise the seed down of the “typha” or bulrush. The fibre is separated from the seed and cleansed and is then felted with a small admixture of hair, or woven, made into paper, combined with vulcanised india-rubber or otherwise heated. When combined with rubber it may be used for making carriage fittings and furniture, hammer cloths, artificial leather and so forth.

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 16.—No. 1485.

THIRION, ALBERT LOUIS.—Mounting carriages on axles. This invention consists “in removing or relieving the axle from the direct weight of the carriage, and receiving it on metallic balls or bodies of a spherical or conical form” revolving between plates or discs such balls or cones not touching the axle. “The plates and balls may be arranged in two different ways.” According to one arrangement they work between plates connected to the inner central part of the wheels (which plates are cupped in order to retain them in their proper positions) and other plates which are connected to the outer ends of two pieces of wood, the other ends of which rise below the body of the carriage and form a “bridge,” these ends being connected by a pin. The body of the carriage rests on this bridge, and by its tendency to press the two parts of wood into a horizontal line forces the plates at the outer ends of these pieces against the balls. In this arrangement the wheels are fixed upon the axle. The bridge may be composed of more than two pieces of wood if desirable.

In another arrangement the axle is furnished with antifriction wheels, and upon these rest the lower of two horizontal plates, between which are the balls or cones, these plates turning on pivots bolted to the floor or bottom of the carriage. The invention may be applied not only to railway and ordinary carriages and carts, but also to velocipedes. "For the latter it is necessary to fix to the axle one or two lateral toothed wheels to work the treadle provided with a pawl or catch, which acts on the teeth only in descending. In rising it would slide over the inclined sides of the teeth."

[*Printed, 8d. Drawing.*]

A.D. 1862, May 16.—No. 1492.

STOCKEN, FREDERICK.—Steps for carriages. "The object of this invention is to obviate the necessity of ladders being used to enable persons to have easy access to high carriages, and consists in applying folding steps to carriages in the following manner:—An opening is made through the side of the carriage, by preference into the boot or that part of the carriage which is over the fore wheels, this opening is closed by a door or panel hinged to it at its under side; this panel can be turned down so as to stand at right angles to the side of the carriage; the folding steps are connected to the upper part of the door or panel, and when the panel is turned down so as to be at a right angle to the side of the carriage, the steps may be turned down and made to descend to any desired distance. When the steps are folded up the door or panel may be closed and the carriage will have the appearance of an ordinary carriage."

[*Printed, 8d. Drawing.*]

A.D. 1862, May 19.—No. 1514.

LEE, JESSE.—(*Provisional protection only.*)—Traction engines. The following is the inventor's provisional specification:—"This invention relates first to the wheels of traction engines; secondly, to the balancing of the boiler; and, thirdly, to the supporting of the intermediate wheel which connects the spur wheel with the pinion on the fly wheel shaft. As regards the wheels the improvement consists in adapting transverse bars of metal to the felloes of the

“ wheels, to ensure greater hold of the said wheels on the  
“ ground than heretofore, so as to prevent the slipping round  
“ of said wheels, and further in connecting together at will  
“ two of such said wheels by plates extending from the felloes  
“ of one wheel to the felloes of the other and opposite wheel  
“ so as to enable said wheels to be worked in a similar  
“ manner to a roller. As regards the balancing of the boiler,  
“ I propose to balance the boiler across the axle and to elevate  
“ and lower the same as may be desired by means of a lever  
“ worked either by hand or by a screw from the fire-box end  
“ of the engine. As regards the supporting of the interme-  
“ diate wheel which connects the spur wheel with the pinion  
“ on the fly wheel shaft, I propose to employ links for that  
“ purpose attached to the axle tree and fly wheel shaft.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 21.—No. 1537.

MEYER, HERMANN CHRISTIAN.—(*Provisional protection only.*)—  
Brake. According to these improvements the inventor uses  
“ the weight of the carriages or their motive power as brake  
“ power,” to which end he shifts or turns the axles or bear-  
ings, and uses “excentric axles or bearings,” or raises or  
lowers the bearings “by any other motion” or reverses the  
excentric axles or excentric bearings generally, thus “facing  
“ the wheels towards a brake fixed on the body of the car-  
“ riage;” or he lowers “the body of the carriage (with fixed  
“ stays and brakes) on to the rails or roadway. The bearings  
“ for railway carriages should be excentric and each have a  
“ moveable stopper or pawl so as to prevent them from  
“ turning” until required, such stoppers or pawls being  
connected by means of levers and connecting rods or chains  
“ to a friction gear on the driving axles of the locomotive or  
“ engine,” such gear being provided with a hand lever,  
within reach of the driver or person in charge of the brake.  
“ When the hand lever is moved it will act so as to wind up  
“ a chain connected to the levers and so liberate the excentric  
“ bearings, when the latter will make a partial turn and so  
“ lower the brakes, which are fixed under the frame of the  
“ carriages above the wheels.” Or the brakes may be fixed  
before or behind the wheels or stays, and be of such length as



to reach to within a short distance of the rails, in which case the body of the carriage will, on the bearings being liberated, sink down upon the rails, the wheels then clearing such rails, the excentric bearings being made to "give a greater throw" than the distance of the stays from the rails. In order to return the carriage to its proper position a second friction apparatus, similar to that already mentioned, may be brought to act so as to turn all the excentric bearings into their first situation, in which they will be again retained by the stoppers or pawls.

The inventor states that various motions may be applied so as to have the same effect as excentric bearings or excentric axles; and that in carriages for common roads "the application of the excentric bearing or excentric axles will cause the axle itself to make a partial turn when break power is to be applied, although the axle will, as usual, remain fixed when the carriage is in progress."

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 22.—No. 1539.

OXLEY, JOHN.—Making wheels. This invention relates to improvements in wheel making machinery and also to a method of joining the spokes to the nave so as to increase elasticity.

"The improvements in the treatment of the felloe pieces of wheels consist in the accurate thicknessing to a gauge of each piece by operating on the two sides at the same time, and this is effected by passing the piece of material to be operated upon between two revolving discs having cutters mounted therein. The machine for thicknessing or planing felloes consists of a bed or gaudry having two moveable headstocks thereon, and a transverse table, upon which is mounted the carriage, and means of holding the piece of material to be operated on. Each headstock carries a revolving spindle or shaft, with an overhanging disc, containing one or more adjustable face cutters or chisels, between which the material is made to pass, and by which it is cut. The distance between the cutters is capable of adjustment by reason of the movement of the headstocks according to the thickness to which the material has to be

“ guaged. Each part of the machine is capable of accurate adjustment and regulation.

“ For the purpose of ensuring accuracy in the after processes of preparing the felloes and other pieces of the wheel, each felloe piece having been examined by the workman has two guage points or centre marks impressed upon one face, so that between these guage points certain guage holes are bored or drilled in a machine designed for the purpose. A central hole is drilled of a depth of say,  $1\frac{1}{2}$  to 2 inches, and on each side of such hole another guage hole of lesser depth (say  $\frac{1}{2}$  inch to  $\frac{3}{4}$  inch deep) is made. By these holes the materials are accurately applied and adjusted in the various machines in which the subsequent operations are performed.” “The machine by which these guage holes are bored for the purpose of regulating the finishing of the felloe pieces consists of a vertical frame or standard provided with a vertically moving carriage or frame having two guage pointers mounted on its horizontal bar, and also the three vertical revolving spindles having drills, augers, or boring instruments fitted thereinto of the necessary length, according to the depth to which the holes have to be bored. The felloe piece to be operated upon being laid upon the table of the machine, and held in its position by a clamp or holder, operated upon by the pressure of the foot of the workman or other attendant or by any suitable means.

“ For the purpose of boring and morticing with greater accuracy and regularity the naves of the wheel for receiving the tenons of the spokes at any required angle with the central axis of the nave, and ensuring that any number of naves for a given size of the wheel may at any future time be produced as identical counterparts of naves previously made, the two operations of boring and morticing are performed without the necessity for removing the nave from the axis, shaft, or spindle by which it is carried during the operation, and without removing it from the compound machine. The carriage upon which the nave is mounted for the purpose of being operated upon is capable of being adjusted in relation to the vertical sliding or revolving tool, and the exact angle may be obtained and recorded upon a scale by means of a pointer arm. The machine by

“ which naves are treated is a vertical apparatus, consisting  
 “ of brackets within which is held a hollow vertical spindle  
 “ or shaft capable of being rotated when the auger or boring  
 “ instrument is in use, and of being held stationary in one  
 “ one position or another when the morticing has to be  
 “ effected. The vertical sliding motion of the chisel is pro-  
 “ duced by means of a crank and connecting rod, the superior  
 “ end of the sliding bar having a ball-and-socket joint. The  
 “ carriage or headstock, between which the nave is held, is  
 “ supported by and capable of vibrating on a cross shaft,  
 “ the centre of which is plumbed by the centre of the vertical  
 “ spindle and the auger or revolving tool. To this carriage,  
 “ by means of a lever arm and bell crank, the index, pointer,  
 “ or arm is connected, and the angle given to the table  
 “ or carriage is read off by means of a scale at the side of  
 “ the machine.

“ For the purpose of forming a more permanent wheel the  
 “ patentee cuts an annular groove or recess within the nave,  
 “ for the purpose of inserting a ring or collar of leather or  
 “ other material, upon which the inner ends of the spokes  
 “ will take their bearing, and thus form an elastic bed or  
 “ cushion between the end of the spokes and the iron axle  
 “ box, and by which means a nearly noiseless wheel will be  
 “ produced.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1862, May 31.—No. 1638.

HOLLAND, JOHN HENRY.—(*Provisional protection only.*)—  
 Traction engines. The improvement “consists in covering  
 “ traction engines or locomotives with their boilers entirely  
 “ from end to end with roofs and sides, of such a nature as to  
 “ assimilate them in external appearance to modern omni-  
 “ buses or railway cars.”

The inventor simply covers “the boiler, funnel, and ma-  
 “ chinery, in the manner described, without providing special  
 “ compartments for passengers.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, June 6.—No. 1705.

DEATH, EPHRAIM.—(*Provisional protection only.*)—Traction  
 engines. This invention consists, “in the first place, in

“ fixing the engine or engines on a bed plate connected to  
“ square plates at each end of the boiler, instead of to the  
“ shell or fire-box of the boiler as usual, thereby obviating  
“ the present liability of the bearings and joints to become  
“ affected by the expansion of the boiler, and also admitting  
“ of the engine or engines being readily disconnected from  
“ the boiler when required.” “ In the second place, in  
“ mounting the axle in two side plates extending from end  
“ to end of the boiler and fixed to the square end plates  
“ thereof, for the purpose of preventing the liability of the  
“ axles to become heated by contact with the boiler.” “ In  
“ the third place, in forming the axle with journals working  
“ in bearings between the side plates and the wheels, which  
“ bearings are fixed to a frame extending the whole length  
“ of the engine. By this arrangement the said journals of  
“ the axle are made to form two pivots on which the hinder  
“ part of the frame rests when the front end of the boiler  
“ is raised or lowered by means of a screw and levers or other  
“ suitable lifting apparatus applied thereto.” “ In the fourth  
“ place, in applying the power for turning a single steering  
“ wheel at or near to the axle instead of above the top of the  
“ wheel as usual. For this purpose a flanged ring is fixed to the  
“ side frames forming a fore carriage, another moveable ring  
“ having a face working against that of the fixed ring, such  
“ moveable ring having also teeth on a portion of its outer  
“ circumference gearing with the ordinary pinion for turning  
“ the wheel. To the moveable ring are fixed brackets between  
“ which are inserted sliding blocks which serve as the  
“ bearings for the axle, a spring of metal or india-rubber  
“ being placed between the upper side of each block and the  
“ under side of the moveable ring.” “ In the fifth place, in  
“ constructing the side or end framing, or both, in the form  
“ of hollow tubes for the purpose of carrying water so as  
“ to dispense with the use of tanks.” “ In the last place,  
“ in using two distinct engines with two fly wheels, which  
“ engines may be disconnected and employed as portable  
“ engines separately, so as to drive two machines in opposite  
“ directions if required, or they may be coupled by means  
“ of a clutch and lever, and made to work to the full extent  
“ of their combined power.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, June 24.—No. 1856.

GRAY, GEORGE. — (*Provisional protection only.*) — Wheels.  
“ Each nave is cast in two parts, in one of which the several  
“ mortices or sockets for the inner end of the spokes are  
“ formed, and such sockets or mortices are made, by preference,  
“ with parallel sides, the mortices radiating from the centre  
“ of the nave. It is preferred that the angular parts of the  
“ nave which come between the spokes should be cast hollow  
“ in order to obtain lightness. The second or outside part of  
“ the casting simply consists of an outside cover to the nave,  
“ which is fixed to it by means of screws, the ends of which  
“ screw into an interposed disc or flat ring of wrought iron,  
“ and this disc or ring is fixed to the first mentioned part of  
“ the casting by means of screw bolts and nuts, the heads  
“ of which bolts are countersunk in the disc or ring, and the  
“ screw bolts pass through holes through the angular parts  
“ of the casting which come between the spokes. In putting  
“ a wheel together the wrought iron disc or flat ring is put  
“ in its place, and so that it does not come in contact with  
“ the casting, but is held by moveable pieces a short distance  
“ away from it, the screw bolts are then passed through the  
“ ring and the casting, the nuts are then screwed up, and  
“ the ends of the wood spokes are driven into their places,  
“ the tennons being slightly taper. The flat ring or disc  
“ does not fit close around the cylindrical central part of  
“ the casting of the nave, against which the inner ends of  
“ the spokes come, when they are driven home, and the  
“ fact of their being driven home will at once be seen  
“ through openings in the centre of the ring or disc. The  
“ spokes having been driven in their places the outer plate is  
“ put into its place and fixed by screws to the wrought iron  
“ disc, should the inner ends of the spokes shrink the disc  
“ may be tightened by the nuts.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, June 30.—No. 1906.

THOMAS, WILLIAM. — Locking or running gear of four-wheeled carriages. The four wheels are all of equal size. Each pair is mounted on a locking carriage and their axles are connected by tension rods which cross each other about

midway of their length. At their intersection are placed friction rollers. The locking carriages have also tension rods connected with curved bars which form the means of attachment of the shafts and which also support the futchels, the latter forming the pole socket. A curved guide is attached to the carriage framing to fix the limits of the locking movement.

The patentee makes the naves of wheels, known as the "patent mail axle and wheel," "of iron instead of wood and iron combined, the sockets for the wooden spokes being cast or formed in the nave."

When brakes have to be applied, the patentee states that he prefers to utilise the backward movement of the horses, but he does not describe any apparatus for the purpose.

[*Printed, 10d. Drawing.*]

A.D. 1862, July 1.—No. 1915.

PRENTISS, ELIJAH FREEMAN.—Locking and running gear for carriages and a carriage body. The first part of the improvements consists in "constructing and fitting both the front and hinder axletrees of four-wheeled vehicles in such a way that they will both turn horizontally round on their vertical axle pins (or 'perch bolts') a given distance, and in connecting the two axletrees together by two crossed connecting rods." "The advantage of this arrangement is that a four-wheeled carriage can be constructed capable of being readily turned in any required direction when driven either end foremost; and in case of omnibuses and other like carriages, a portion of the upper parts of the wheels may revolve within recesses in the carriage body below the seats, thereby obtaining the advantage of a broad and low vehicle."

"The second part," says the patentee, "relates to the construction of light carriage bodies for open passenger vehicles, and consists in a light parallelogramical frame of wood, angle iron, or other suitable material, between and from the longitudinal sides of which spring a number of light arched spanners of wood fitted with metal tie rods, or they may be constructed entirely of metal. On the crown of the arched spanners I construct a vertical longitu-

“ dinal railed or other suitably shaped back for longitudinal  
“ seats fitted on each side thereof. The seats I prefer  
“ should be cane-seated frames fitted with loose cushions.  
“ The foot rests and the stages at each end of the body I  
“ propose to form of light open grating framework, and to  
“ surround the whole with a light rail or light open frames  
“ or closed pannel-work except at the openings left for  
“ ingress and egress. I further propose to erect two or more  
“ standards extending above the centre back rail for sup-  
“ porting a suitable double hood which can be let down at  
“ both or either side of the carriage.”

[*Printed, 8d. Drawing.*]

A.D. 1862, July 7.—No. 1956.

WESSELY, CHARLES. — (*Provisional protection only.*) — Improvements in carriages. The following is the inventor's provisional specification.

“ The load and weight of the body of the carriage rests  
“ wholly or chiefly upon the nave of the carriage wheels  
“ without bearing upon the axletree, viz., cranked axletree.  
“ This is effected by means of antifriction wheels, which bear  
“ upon the naves of the above-mentioned carriage wheels,  
“ and turn concentric around steel trunnions. These steel  
“ trunnions are fixed each in the upper part of a vertical  
“ piece of flat iron, whose lower end encompasses, by means  
“ of clutches, the vertical parts of the crank axletree in such  
“ a way as to allow an up and down sliding of the former.  
“ Unto these pieces of flat iron the body of the carriage is  
“ attached either by means of springs or directly. A knuckle  
“ is formed on the piece of flat iron just above the highest  
“ point of the crank axle, so as to form a rest for the whole  
“ load upon the crank axle in case the trunnion of the anti-  
“ friction wheels should give way, and thus may move on  
“ like common vehicles. By this construction I effect,  
“ firstly, the possibility of moving heavy loads by smaller  
“ power through application of my antifriction wheels and  
“ carriage wheels of larger size. Secondly, great stability,  
“ by placing the centre of gravity comparatively very low.  
“ Thirdly, easy way of loading and unloading, by the low  
“ position of the body of the carriage. Fourthly, prevention

“ of all accidents, in consequence of the peculiar suspension  
“ of the body of the carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, July 15.—No. 2028.

LESLIE, ALEXANDER.—Propelling vehicles. This invention chiefly relates to the propulsion of cultivating implements by means of powers communicated by ropes from a fixed engine. The patentee does however describe an application of the system to the propulsion of a carriage.

He says, “ In applying the improved arrangements according to one modification to actuate a wheeled carriage, the endless rope actuated by a stationary prime mover acts on a vertical first motion shaft with self adjusting details, such as are herein-before described, such first motion shaft being passed through a hollow vertical spindle carried by the framing of the carriage, but so that it can be turned. The lower part of the vertical spindle is formed into a fork with bearings for the axle of a pair of propelling wheels, which serve both for propelling and for steering. The propelling action is communicated to the wheels through bevil gearing from the vertical first motion shaft, described as passing through the hollow spindle, and the steering action is obtained by worm wheel or bevil gearing fitted to the hollow spindle, whereby the wheels can be shifted into any position. The direction of the carriage’s motion can be reversed by simply turning the hollow spindle with the propelling wheels half round.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1862, July 22.—No. 2080.

FOURNIER, AUGUSTE. — Seats for carriages, &c. The patentee says, “ I place instead of the ordinary webbing, bands of vulcanized india-rubber across the frame of the chair or other seat or mattress, vertically and horizontally interlacing them, and fixing them to the framework, making by this means an elastic foundation; after which the chair or other seat or mattress, is stuffed in the ordinary manner, and in this way I also construct the backs of chairs where they are stuffed or padded.”

[*Printed, 4d. No Drawings.*]



A.D. 1862, July 28.—No. 2141.

BURNETT, EDMUND.—Combined cart and sleigh. “The shafts are jointed by a hinge to the cart or sleigh, and at a short distance from the joint underneath each shaft a curved branch or arm of iron descends, forming a connecting stay, which is attached to a flat spring extending across the under part of the boot, to which it is attached by bolts or screws or other fastening. The curved arms are hinged at a short distance from their attachment to the shafts in order to allow the shaft points to descend to the ground when not in use, and also to prevent fracture or other damage to the shafts or cart in the event of the horse falling. This arrangement also relieves the shafts of much weight and strain. The springs are formed of elliptical bars or plates, and only consist of four plates, presenting the appearance of a small spring inside a larger one, with which it is only connected at the upper and lower bearing surfaces of the cart and axle. The seats are made to hold four persons, who sit back to back; the front seat is adjustable, and can be shifted backwards when only two persons are to ride, so as to cause the cart to balance as when four persons are riding. When the wheels are removed as well as the iron feet on which the cart falls forward and bears on the ground when not in use, the body can be attached to a sleigh frame, and be used in winter as a sleigh with all the advantages of the spring shafts before described.”

[*Printed, 8d. Drawing.*]

A.D. 1862, August 9.—No. 2230.

HASELTINE, GEORGE. — (*A communication from Charles Leavitt.*)—Wheels. “The construction of the hub is such that the spokes of the wheel can be arranged in two rows, thus forming a broader base, the spokes being in contact with each other for part of their width, thus filling the entire circle, while at the same time each separate spoke is supported in part or in whole upon each side by a metallic mortise. The hub being formed in two parts and made of metal, enables” the inventor “by means of a screw upon the pipe box to compress the spokes edgewise, and thus

“ preserve their position in the wheel, at the same time the  
 “ desired amount of dish is given to the wheel by means of  
 “ the back part of the hub being concave and the front part  
 “ convex where the two parts impinge against the edge of  
 “ the spokes. By this arrangement the largest possible  
 “ number of spokes can be introduced, the required amount  
 “ of dish obtained, and each spoke be supported by a metallic  
 “ bearing upon either side, and at the inner end upon the  
 “ pipe box. Any shrinkage in the spokes causing looseness  
 “ can be remedied at any time by screwing up the nut that  
 “ holds the parts together. The wheel is also so constructed  
 “ that each spoke has a bearing upon the pipe box.”

[*Printed, 8d. Drawing.*]

A.D. 1862, August 11.—No. 2243.

AMIES, NATHANIEL JONES.—“ Bearings or steps employed in  
 “ machinery and railway and other carriages.”

The bearings are “ to be cast of malleable cast iron, and  
 “ formed with cavities or recesses, for the filling ” of composi-  
 “ tion “ to be opposed to the frictional surface requiring lubri-  
 “ cation, and which may be made of caoutchouc, gutta-percha,  
 “ or other elastic gum, one part; plumbago, steatite, or  
 “ plastic, earthy, or metallic matter three parts; and vege-  
 “ table or animal gum or size, one part; or such other com-  
 “ ponent parts as may be found desirable; but when water or  
 “ liquid in a heated state has to come into contact with the  
 “ composition ” it is preferred to “ employ a gum called  
 “ *rhus copallinus* (gum copal) which is better calculated to  
 “ resist the action of heated liquids. This composition may  
 “ be employed alone, suitably cast or formed without the  
 “ addition of wood or metal.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, August 13.—No. 2278.

JOHNSON, JOHN HENRY.—(*A communication from Pierre Henri Dubreuil and Jean Baptiste Dubreuil.*)—Weighing carts. This invention relates to improvements directed with the view to make carts and other vehicles “ capable of weighing their  
 “ own loads. The body of the vehicle is made independent of  
 “ the framing when weighing a load, and solid with it when

“ simply transporting the load towards the back of the framing.  
“ There is, according to one arrangement, a transverse shaft  
“ to which a forked lever is attached, and this lever at its fore  
“ end presses during the process of weighing upon one arm of  
“ a Roman balance placed in front of the vehicle and attached  
“ thereto. Regulating screws attached to the framework are  
“ made to support the body during transit, but when the  
“ operation of weighing is to take place these screws are  
“ lowered, and the body of the vehicle is then thrown upon  
“ the forked lever, which acts, as before mentioned, on the  
“ weighing apparatus.”

[*Printed, 10d. Drawing.*]

A.D. 1862, August 14.—No. 2290.

CURTIS, WILLIAM JOSEPH.—Passenger indicator. For this purpose there is provided “ a packet of cards having on their  
“ face a graduated dial, numbered and representing distances  
“ in miles, half miles, and quarter miles, if necessary. Each  
“ omnibus passenger or hirer of a cab will receive one of  
“ these cards on entering the vehicle, it having been pierced  
“ by a punch to indicate a starting point on the dial. On  
“ leaving the vehicle the card is to be again pierced, and the  
“ distance between the two nicks in the card will show the  
“ distance traversed. The punch will, however, when making  
“ the second nick, which indicates the termination of the  
“ passenger’s journey, strike out a portion of the card, and  
“ discharge it into a receiver, which is accessible only to the  
“ proprietor of the vehicle. This punched out portion will  
“ have a counterpart of the nicks retained by the passenger,  
“ and will therefore show the amount of the fare chargeable  
“ to the passenger.” After describing machinery for so  
treating the cards the patentee says, “ I may in some instances  
“ mount in the vehicle a rotating dial (with a fixed pointer)  
“ corresponding to that on the card. The dial in this  
“ instance I connect with the gearing which drives the  
“ rotating table, and thereby ensure a corresponding rotary  
“ motion between this dial and the table. The use of this  
“ rotating dial is to afford passengers a means of checking the  
“ marks on their cards when entering and leaving the vehicle.  
“ In vehicles hired by time the rotating table may be operated

“ by clockwork, and the dial on the card to be pierced may  
 “ represent a clock face. The distance between the nicks  
 “ made on entering and leaving the vehicle will in this case  
 “ show the time consumed in the journey.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1862, August 26.—No. 2369.

NEWTON, ALFRED VINCENT.—(*A communication from Jonas Farnsworth and Edward Millar Farnsworth.*)—(*Provisional protection not allowed.*)—Instrument for cleaning windows.

“ On the extremity of a syringe, formed by a tube and a  
 “ longe handle working therein as a piston, is fitted a rubber  
 “ and a sponge or other porous medium. The handle is  
 “ made of any convenient length, to enable the person  
 “ using the instrument to reach his work, and it is packed  
 “ at its inner end like a piston. The tube terminates in  
 “ an expanded and flattened end, to receive on one side the  
 “ sponge, and on the other the rubber. A vent is made in  
 “ this terminal to allow of water being ejected from the  
 “ syringe in a small stream. To use the instrument its end  
 “ is inserted in a pail of water and the handle is drawn up  
 “ until the tube is filled. The instrument thus charged is  
 “ raised to the window to be cleaned, and the water is ejected  
 “ therefrom on to the glass by forcing the handle inwards.  
 “ The sponge moistened by insertion in the pail is then  
 “ applied to the wet glass, and the dirt will be readily wiped  
 “ off. If however any dirt is still found to adhere the rubber  
 “ formed of vulcanized caoutchouc or other suitable material  
 “ is brought to act upon the moistened surface, and by  
 “ friction of contact it will remove the dirt from the glass.”

“ The instrument may also be applied with advantage to  
 “ the cleaning of carriage panels and other painted surfaces.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, August 27.—No. 2378.

MAYES, WILLIAM MILLBANKE.—(*Provisional protection only.*)—  
 Preventing concussion in wheels and axles. The following is  
 the inventor's provisional specification:—“ My invention  
 “ consists in inserting in the nave of wheels or in a box or  
 “ casing surrounding the axle or nave, a spiral spring or  
 “ springs. The springs surround the axle and all shock or

“ jar to the axle during the running of the wheels is prevented.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, August 29.—No. 2402.

MACKENZIE, PHILIP WALLACE, and SMITH, STEPHEN WILLIAM.—Velocipedes. The patentees say, “The first part of our invention relates to the construction and combination of parts by means of which the propulsion of the vehicle is accomplished. In this device a double cranked axle is used and in the arrangement which we have adopted as the best two cranks are formed in the same parallel line to the centre and upon the side opposite, and at the same or nearly the same distance from the centre of rotation. The seat of the rider is connected to the two cranks which are upon one and the same line, and the pedals upon which the feet press are connected to the other crank for the purpose of giving continuous rotation and consequent locomotion by means of the transfer of the weight of the body alternately from the seat to the pedal, and vice versa.

The second part of our invention relates to the mechanism for hanging and supporting the steering wheel, it being supported in segmental bearings. The segmental bearings in which it is hung are allowed to turn in a circular plate made in two parts, and attached to the parts which extend down astride of the said steering wheel.

“The third part of our invention relates to the manner of connecting and arranging the steering gear in relation to other parts. A forked lever is attached either to the segmental bearings or to the axle of the steering wheel, which, by means of a further lever and other connections, is operated by a cross bar or bit with reins attached, the same as an ordinary bridle. The seat of the rider we usually prefer to make in the form of a horse, and the bit is then placed in the mouth of the figure of the animal.”

[*Printed, 10d. Drawing.*]

A.D. 1862, August 29.—No. 2404.

UPFILL, WILLIAM, MORTON, WILLIAM, and ASBURY, WILLIAM.—Wheels and axletrees. “The nave and axle box

“ are constructed separately, but previously to being adapted  
 “ to the axle tree they are secured together by screwing or  
 “ otherwise. The nave which receives the spokes of the wheel  
 “ is bored out or cast with a hole to fit on the axle box, on  
 “ which it is secured by a screwed cap, or by bolts, or other-  
 “ wise. By this means the nave with its cap and axle box are  
 “ all connected together and form one piece, which is secured  
 “ on to the axletree by means of tongues, pins, studs, or pro-  
 “ jecting pieces which are made to take into a groove or  
 “ grooves cut or made round the axletree. These tongues,  
 “ pins, studs, or projecting pieces are made moveable and  
 “ are inserted in dovetailed grooves or sockets made in the  
 “ metal washer, which is by preference cast on to the end of  
 “ the axle box, but may, if desired, be made separate, and  
 “ in order to prevent these tongues or their equivalents from  
 “ coming out accidentally they are secured in their places by  
 “ cross pins or screws.”

[*Printed, 10d. Drawing.*]

A.D. 1862, September 4.—No. 2444.

COOK, JOHN.—(*Provisional protection only.*)—“Improvements  
 “ in carriages.”

The improvement “consists in constructing two-wheeled  
 “ carriages so as to admit of being coupled longitudinally,  
 “ and employed together as four-wheeled carriages, space being  
 “ left between the couplings of the fore and hind wheels for  
 “ the object of the lock or turning, whereby wheels of large  
 “ and uniform size may be used throughout in connection  
 “ with cranked or plain axles, and the said carriages coupled  
 “ either singly or in sets.”

[*Printed, 6d. Drawing.*]

A.D. 1862, September 16.—No. 2539.

BUNTING, JOHN GOLDING.—(*Provisional protection only.*)—  
 “Mechanical horse-break.”

The inventor proposes “to construct a horizontal framing,  
 “ somewhat in the form of a pair of cart shafts, the hinder  
 “ extremities of which are left open for the entrance of the  
 “ horse; these shafts are connected by means of an arched  
 “ axle, the arch extending over and across the haunches of  
 “ the horse, ordinary carriage or cart wheels being attached

“ to the arms of the axle. The fore parts of the shaft rest  
“ on a fore carriage and wheels, to which is attached a pole  
“ or shafts for the purpose of harnessing either a single horse  
“ or pair.

“ The object of this invention is that an ungovernable horse  
“ may be harnessed within the frame or carriage and be  
“ retained therein by means of bands and straps passing  
“ over his back and under his belly, and attached to  
“ each side of the frame or carriage, by which means he can  
“ neither lie down nor rise from the ground, hames being  
“ attached to the fore part of the framing, and also a collar  
“ strap, whereby the horse is securely held in position and  
“ compelled to follow the leader or leaders in the pole or  
“ shafts. A ‘dickey’ seat may be placed on either or both  
“ sides of the axle for the use of the driver, whereby the  
“ leaders may be driven and controlled as well as the horse to  
“ be broken.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, September 16.—No. 2541.

FLEXEN, STEPHEN. — Ventilating carriages. The patentee says, “ I propose to attach to the sections or divisions of wire  
“ gauze as at present used in the doors and windows of car-  
“ riages, a cord either of silk or cotton or other textile mate-  
“ rial, or of plaited or twisted wire, passing over rollers or  
“ pullies fixed or adjusted in the frame of the door, and secured  
“ to the rail of the ventilator. A metallic rod or counter-  
“ balance is enclosed in a groove or passage cut in the solid  
“ portion of the framework of the door or window, and is  
“ suspended to the cord or metallic rope passing over a pulley  
“ fixed in the upper part of the frame. The rod or balance  
“ weight being guided by means of an eye through which it  
“ rises and falls, and thus allows the sash of the window to be  
“ completely shut. By this arrangement, when the window  
“ is opened or drawn down, the gauze ventilator is simulta-  
“ neously actuated, thus preventing an undue or excessive  
“ draught of air, and at the same time permitting a sufficient  
“ current to effect the required amount of ventilation to the  
“ carriage.”

[*Printed, 8d. Drawing.*]

A.D. 1862, October 1.—No. 2657.

VAN DER BYL, PETER GERHARD.—(*A communication from Charles Bell.*)—"A power conserver brake."

This invention is applicable to the engines and carriages used on railways, as also to vehicles for common roads, the arrangements being such that "the power which is expended " by such stopping or retarding is accumulated or stored up " by the apparatus and given out again by the same when " it is required to start the machines, engines, or vehicles " again, so as to assist them in their motion."

Different modes of carrying the invention into effect may be employed. Thus there may be placed upon one of the axles of a carriage two bevil wheels facing each other, and revolving with the axle, but capable of being moved to and fro thereon, there being between these wheels a third wheel mounted upon a shaft or spindle, which the patentee terms a brake spindle, the two wheels on the axle being moved into and out of gear with this wheel at pleasure by means of levers. To the brake spindle may be attached one end of a strong volute or spiral spring, the other end of which is attached to the framing, the arrangement being such that upon placing one of the wheels on the axle into gear with that on the brake spindle, the latter will wind up the spring, the force required to wind up the spring serving to retard the motion of the engine or carriage, and if the other bevil wheel on the axle be now also brought into gear with that on the brake spindle, the motion of the engine or carriage will wholly cease, no further rotation of the axle being possible. When it is desired that the carriage or engine shall again move forward, the first wheel on the axle is placed out of gear with that on the brake spindle, and the wound-up spring by its effort to unwind, will so act upon the brake spindle and the wheel thereon, and through the latter upon the second wheel upon the axle, as to aid in turning that axle and starting the engine or carriage. Instead of a spring a drum may be placed upon the brake spindle, a cord or chain passing round this drum carrying a weight which will be raised in stopping, and allowed to descend in again starting the engine or carriage. Or the spindle may be connected by cranks or gearing to the rod of a piston placed in a cylinder containing air, steam, or other compressible and expansible



gas or fluid; or a liquid may be caused to rise and fall in a pipe connected to such a cylinder; “or any other known contrivance may be employed, by which if the brake spindle revolves in one direction, it accumulates power, which power is capable of being afterwards expended in causing the spindle to revolve in the reverse direction.”

In order to adapt the invention to vehicles which are provided with wheels running upon fixed axles, a bevil wheel is connected to one of such wheels concentric therewith, and the brake spindle is furnished with two bevil wheels, one on each side of that on the wheel of the vehicle, and capable of being placed in and out of gear therewith, the same results being thus attained as in the first arrangement. Or instead of a bevil wheel being attached to one of the running wheels only, several of the latter may be so provided, and a corresponding number of brake spindles used.

The details of the invention are described at some length, and as applicable not only to railway engines and vehicles for common roads, but also to stationary steam engines; and the patentee mentions that in cases in which the engine or vehicle is meant to travel at a high speed, it may be desirable to use “Robertson’s grooved frictional gearing instead of toothed wheels,” the teeth of the latter being liable to fracture in such cases; or the bevil wheels may be brought into action through the medium of conical clutches, the wheels being constantly in gear, and those upon the axle being loose thereon.

[*Printed, 1s. Drawings.*]

A.D. 1862, October 4.—No. 2678.

LEE, JOSEPH, and LEE, WILLIAM.—Traction engines. Part of this invention relates to certain improvements in boilers for various purposes. The rest of the improvements “consist in giving motion to the main or driving pair of wheels by a pinion on the crank shaft of the engine gearing into an intermediate wheel on the axis of which is another smaller wheel which gears into a toothed wheel on the axis of the main or driving wheels. The intermediate wheels turn on a stud which projects from the bracket which carries the crank shaft; this stud, the crank shaft, and the axis of the

“ main wheels are so placed that their centres are all in one  
“ vertical line. In place of the above combined arrangement  
“ two driving wheels are placed under the body part of the  
“ boiler, and upon the axle of the said wheels two cog wheels  
“ are placed one on one side of the boiler, and the other on  
“ the other side thereof. In order to give motion to the cog  
“ wheels a shaft is applied under the body of the boiler  
“ parallel with the axle of the driving wheels. On this shaft  
“ are applied pinions for fast and slow speeds. A chain and  
“ chain wheels are also applied between the crank shaft and  
“ the lower shaft in order to give motion from the crank shaft  
“ to such lower shaft. Or an inclined shaft and bevil gear  
“ may be used instead of the chain to connect the shafts.  
“ This arrangement admits of steel or india rubber springs  
“ being applied with advantage.”

*[Printed, 4d. No Drawings.]*

A.D. 1862, October 6.—No. 2702.

CHINNOCK, CHARLES.—Axle-boxes. This axle box is designed to neutralize the friction due to lateral pressure of wheels against the axle shoulders. The patentee says:—“ I turn in  
“ an enlargement of the axle (which forms the shoulder for  
“ receiving the endway pressure of the axle box) a semi-cir-  
“ cular ring groove, and in an annular cap piece which fits  
“ over this enlargement of the axle and in the inner end of  
“ the axle box which butts against it I turn the counterpart  
“ of this groove, and I thus form an annular channel in which  
“ I insert a series of antifricition balls. A rebate is turned in  
“ the annular cap to receive a ring of packing, and also to  
“ receive a shoulder turned on the axle, which collar lies  
“ against the packing ring. The balls are dropped into their  
“ groove before the axle box is put on, a lateral recess being  
“ made in the annular cap piece for permitting of their in-  
“ gress. When inserted, a screw is applied to fill this recess,  
“ and thus the balls are kept in place even before the axle  
“ box is applied to the axle. Screw bolts passing through the  
“ hub of the wheel connect the wheel and annular cap piece  
“ together, and so long as this connection is maintained, the  
“ wheel will be secure on its axle as the cap piece is retained  
“ in its position by means of the balls.

“ It will now be understood that the lateral pressure of the wheel will be taken up and neutralized by the antifricition balls, which will require to be lubricated at the time of lubricating the axle box. A modification of this arrangement, suitable for common purposes, may be made by grooving the extremities of the axle to receive a series of balls, and making the cap piece the cap of the box, and attaching it in the manner described to the hub of the wheel, but to the outer face thereof.”

“ Another improvement in axle boxes is intended to prevent the frequent loss of the cap which is screwed thereon to close the end of the box. To this end I apply to the cap a catch which is jointed thereto, and projects inwards through the flange of the cap, so as to bear against, say, the hub of the wheel. This catch is pressed inwards by a spring, thereby producing sufficient adhesion between the catch and the hub to prevent the cap from turning even if it were loose. When a spanner is applied to the axle box for removing the cap the catch will be tripped up, and thus it will offer no impediment to the removal of the cap.”

[*Printed, 10d. Drawing.*]

A.D. 1862, October 7.—No. 2704.

SMITH, JOSEPH.—(*Provisional protection only.*)—Screw linch-pin. “ This invention of an improved screw linch-pin for carriages and agricultural implements, consists in making an aperture in the linch-pin large enough to receive a screw; a hole is then drilled from the end of the arm up to the linch-pin, and the screw is then applied and fixed in the aperture of the linch pin; this arrangement preventing the possibility of the linch pin falling out. This contrivance will prevent accidents occurring by the linch-pin coming out of its place, and the arm is always kept cool, thus preventing the wheels being fired.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, October 10.—No. 2737.

EDGE, WILLIAM CHARLES.—(*Provisional protection only.*)—Veloipedes. The propulsion of the carriage here described is effected by means of treadles which at each stroke engage

with studs or pins attached to rings secured to the wheels, and force the latter round. The return stroke of each treadle is effected by an india-rubber spring and the portion of the treadle which engages with the wheel being hinged, the return stroke does not affect the studs in any way.

[*Printed, 6d. Drawing.*]

A.D. 1862, October 13.—No. 2752.

GALLIS, AUGUST FRIEDRICH.—Covering omnibuses. For this purpose the side rails are fitted with stanchions or pillars which are capable of being elevated by means of a winch. When elevated, they form the support for the cover which is drawn over the frame by the conductor. Side curtains are also fitted.

[*Printed, 10d. Drawings.*]

A.D. 1862, October 13.—No. 2753.

HASELTINE, GEORGE.—(*A communication from Lyman Derby.*)

“Improvements in ‘jacks’ and screw nuts for attaching thills and poles of wagons and other vehicles to the axletrees of the same.”

The patentee states the nature of the invention to consist “in the employment of a longitudinal screw bolt working on a centre pin through its head, and the end of the thill irons, in combination with a jack and clip iron secured on the axletree for the purpose of uniting the thills or pole to the running part of the vehicle.”

It “further consists in a compound screw nut for securing the longitudinal bolt in the jack so as to hold the thills firmly united to the axletree by a working joint that may at all times be made to compensate for the wear of the parts of metal in contact, thereby preventing all rattling and jarring noise consequent upon the constant motion of the thills when in use.”

[*Printed, 6d. Drawing.*]

A.D. 1862, October 13.—No. 2758.

GUMBLEY, JOSEPH.—Brake. The object of this invention “is the construction of apparatus in such manner that the power or pressure exerted by a horse (or other draught

“ animal) in keeping back a vehicle when descending a hill  
 “ or incline shall be so transferred or transmitted as to  
 “ force a break on or against the wheel. This may be effected  
 “ as follows:—The breeching or other means on which the  
 “ horse or draught animal acts or presses to keep back the  
 “ vehicle (when descending a hill or incline) instead of being  
 “ attached to the shaft or pole is attached to a chain or strap,  
 “ or to chains or straps, such chain or strap or each such  
 “ chain or strap runs round a pulley fixed on the under part of  
 “ the shaft, or at the end of the pole, or in such like position,  
 “ and thence passes to the end of a lever which works on a  
 “ pin or axis at the opposite side of the vehicle; such pin or  
 “ axis is fixed through the shaft or in other convenient part.  
 “ The lever carries the break block, skid, or similar contri-  
 “ vance. When the horse (or other animal engaged in drawing  
 “ the vehicle) applies pressure against the breeching or other  
 “ means on which it acts for keeping back the vehicle, the  
 “ levers will be thereby worked, and will bring the break  
 “ blocks or other equivalent contrivances into action.”

[*Printed, 6d. Drawing.*]

A.D. 1862, October 14.—No. 2766.

SNIDER, JACOB, junior.—Hansom cabs. “My invention,” says the patentee, “consists in the application to the forward  
 “ part of the top or front of the vehicle” of “a folding or  
 “ moveable cape or curtain sustained by a frame, and which  
 “ can be projected and retracted at pleasure, and which is  
 “ primarily destined to serve as a protection from the weather  
 “ in lieu of the present inside folding glass or framed shutters  
 “ as flaps, called ‘the glass,’ but also as a sun shade. I make  
 “ a folding frame similar to the frame of a moveable or fold-  
 “ ing gig or barouche top, of which the outer rib or piece is  
 “ of metal, and the inner ribs of light metal, wood, rattan, or  
 “ other material. The outer rib or piece of this frame is  
 “ hinged on to each side of the vehicle, and to this the lighter  
 “ inner ribs are attached. Over this frame, in its most ex-  
 “ tended form, is affixed a covering of leather or other mate-  
 “ rial, which will readily fold as the frame is drawn together,  
 “ the outer or front edge of the covering being firmly attached  
 “ to the outer rib or piece of the frame over its whole extent,

“ and the rear or back edge of the covering is firmly attached  
“ to the sides and top of the vehicle. This frame constituting  
“ the cape or curtain, is drawn up in place against the front  
“ of the vehicle by a string or cord or thin rod at the com-  
“ mand of the driver.”

[*Printed, 8d. Drawing.*]

A.D. 1862, October 15.—No. 2776.

MOLYNEUX, ECHLIN, junior.—Carriage with travelling railway. This carriage is supported in the following manner. Each wheel may be imagined as cut diametrically in halves. Each half is mounted at a distance from the other on the axle, the bearing or axle box for each pair of halves being in the space between. Each half wheel rolls upon a short section of rail connected with the carriage. Consequently there are four lines of rails. Each length of rail is carried on small wheels or castors and is placed in front of its half wheel at the proper moment by means of gearing, of which several modifications are described. The movement of the vehicle supplies the powers for shifting the rails, and the latter moreover are so constructed as to be capable of turning to the right or left when it is desired to change the direction of motion. Various forms of rails are described.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1862, October 22.—No. 2850.

ORLOWSKI, VALENTINE.—(*Provisional protection only.*)—Propelling carriages. The inventor says:—“ I propose to attach  
“ to and fix on the axle of the driving wheels at the centre  
“ thereof a small toothed pinion, into which a larger toothed  
“ wheel is made to gear, and which latter wheel is mounted  
“ on an axle set in bearings upon a standard in front of the  
“ driving seat, the standard being bolted to the framework  
“ of the carriage; or I cause the driving axle to be worked  
“ by means of an endless chain in lieu of toothed gearing.  
“ A winch handle is attached to the axle of the driving  
“ toothed wheel, or the wheel over which the endless chain  
“ passes, by which means the driver actuates the main driving  
“ wheels, and thus causes them to rotate, and thereby propel  
“ the carriage. The mechanism may be modified if desired

“ by causing the large toothed wheel to gear into a pinion on  
 “ an independent shaft set in bearing journals bolted to the  
 “ framework, and on which axle a second large toothed wheel  
 “ may be set in such position as to gear with the main action  
 “ pinion, by means of which I propose to gain power, and  
 “ multiply the speed of the carriage accordingly. The car-  
 “ riage is to be steered by means of an under locking plate,  
 “ which is to be turned in the required direction by the  
 “ action of the feet of the driver upon pedals or treddles  
 “ having connecting rods and gearing attached thereto, or by  
 “ means of a vertical stem turned by a handle.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, October 24.—No. 2870.

DEVLAN, PATRICK SARSFIELD.—Composition for bearings, axle boxes, &c.

The patentee says:—“ I manufacture a composition which  
 “ I call composition No. 1, by combining asbestos or other  
 “ mineral fibrous substance reduced to a pulp or pulpy or  
 “ similar consistency with albumen or with dextrine, gum  
 “ tragacanth, gum kouri, gutta percha or other gum, gum  
 “ resin, or mucilage, or two or more of these and with  
 “ graphite or plumbago, and steatite, talc, or other silicate  
 “ of magnesia or a compound thereof. Or instead of or in  
 “ addition to albumen gum, gum resin, or mucilage, I some-  
 “ times use in this composition gelatine, starch, gluten or  
 “ gelatinous, amylaceous, feculous, or glutinous materials or  
 “ compounds.

“ I also manufacture a composition, which I call composi-  
 “ tion No. 2, by combining albumen with leather or other  
 “ animal fibrous substance reduced to pulp and with graphite  
 “ and steatite or other silicate of magnesia or compound  
 “ thereof, or instead of or in addition to albumen, I some-  
 “ times use in this composition starch, gluten or amylaceous  
 “ or feculous materials.”

“ I also manufacture an improved composition, which I call  
 “ composition No. 3, (for the same purposes) by combining  
 “ cotton, hemp, or other vegetable fibrous material reduced  
 “ to pulp with albumen, or gutta percha, gelatine starch, or  
 “ gluten, or a glutinous, feculous, amylaceous, or gelatinous  
 “ product or compound, or two or more thereof, and with

“ graphite or plumbago, and with steatite, talc, or other silicate of magnesia or compound thereof.”

“ In manufacturing the compositions, the ingredients should be well mixed together in a plastic state and dried by heat, and pressed by hydraulic or other pressure, or the compositions may be moulded or pressed when plastic into moulds, boxes, or shells and allowed to dry. The recess for a journal may be produced by pressing the composition round the journal (which is to run in it) or round a mandril, the composition will serve for the lining or packing of axle boxes and steps, and for the production of other bearing surfaces, and surfaces or articles subjected to friction.”

[*Printed, 4d. No Drawings.*]

A.D. 1862. October 29.—No. 2912.

CLARK, WILLIAM.—(*A communication from Pierre Pradel.*)—Indicator for vehicles. The apparatus described in this specification is capable of various applications. In its use in vehicles, it consists of a train of clockwork which passes between rollers a ribbon of paper. The carriage is fitted with a false or moveable seat or bottom, which when lowered sets the clockwork in motion at the same time marking the papers. The seat or bottom must be raised by the driver when the passenger leaves the carriage, otherwise the apparatus continues to record against him. The raising also puts out an indicator to show that the vehicle is for hire. A luggage platform may also be put in connection with the apparatus.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1862, November 5.—No. 2990.

ROBOTHAM, SAMUEL.—(*Provisional protection only.*)—Carriage bodies.

According to the inventor the improvement “relates to carriage bodies, and has for its object an improved manufacture of the back and arms part thereof, or the part forming the back and arms of the body. For this purpose I construct a framework or outline of the desired shape, and similar to the construction hitherto used for the support of japanned leather and other materials, and this framework or outline I fill in with ductile sheet metal. I take plain,



“ perforated, or embossed sheet metal. If plain, I cut a  
 “ blank and shape it on a block, pressing it or beating it  
 “ into form; I then finish it by hammering or otherwise;  
 “ heat may be applied to anneal or facilitate the manipula-  
 “ tion. If the perforated metal be used I do not generally  
 “ heat it; and I prefer to use zinc, which I hammer or press  
 “ into shape. If embossed metal be used I shape it by cutting  
 “ out or letting in parts where there is a bend; or the em-  
 “ bossing may be performed upon the plain shapes after they  
 “ are formed as before described. I sometimes construct the  
 “ outline or framework of unsoldered tube or metal formed  
 “ into nearly a tube (the longitudinal edges not quite meet-  
 “ ing), and insert the margin of the metal through the slit  
 “ or space between the edges and solder it; or when this  
 “ form be not used, the edge of the metal may be turned over  
 “ or under the framework and soldered. The whole may be  
 “ painted, japanned, or coated with other metal, if desired,  
 “ or the beading, tube, or rod may be left bright by plating  
 “ or otherwise.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, November 15.—No. 3076.

RIMMER, JOHN. — (*Provisional protection only.*) — Hansom cabs. The inventor says, “ to the ‘ body ’ of the cab close to  
 “ the heel board I fasten a pillar or spindle, which I carry  
 “ upwards through the curved or otherwise formed hind part  
 “ of the shafts, or through or between a shoulder or shoulders  
 “ an eye or eyes, or their equivalents, thereto attached. On  
 “ the said pillar or spindle I place one, two, or more helical  
 “ or spiral springs, part of which are below and part above  
 “ the shafts or shoulders or eyes thereon, and a sufficient  
 “ number of nuts and washers or other arrangements for  
 “ keeping the said springs in their places. The shafts are  
 “ jointed by a pin or otherwise to fixed or rigid stays, so  
 “ that when the tyre of the wheel passes over a stone or any-  
 “ thing above the level of the road, or in a rut or any place  
 “ under the level of the road, the joints allow the shafts to  
 “ move and maintain the same relative position to the horse,  
 “ and the helical or spiral springs above and below the ends  
 “ of the shafts receive the shock, and relieve the ‘ body ’ of

“ the vehicle from the sudden jolt and subsequent vibration  
 “ so disagreeable in all hansom cabs now made. The rigid  
 “ stays to which the shafts are jointed or coupled do not  
 “ require, when helical or spiral springs ” are “ used, to be  
 “ carried so far forward as in those hansom cabs where springs  
 “ are not used, nor as in those with long flat springs, conse-  
 “ quently the horse can be brought back close to the ‘ bow ’  
 “ of the shafts and to the ‘ body.’ ”

[*Printed, 4d. No Drawings.*]

A.D. 1862, November 21.—No. 3139.

SUTTON, AARON.—Indicator for vehicles. A clock movement is provided which shows by different dials the time of hire, the fare to be paid and the total of the day's earnings. To the clock case are attached notice labels signifying “ hired ” or “ for hire.” The clock movement is put into operation or stopped by the turning one way or the other of these labels. Apparatus is also provided whereby the indicator can be made to show the circumstance of a passenger alighting before the course is completed.

[*Printed, 10d. Drawing.*]

A.D. 1862, November 26.—No. 3173.

AUSTIN, WILLIAM.—(*Provisional protection only.*)—“ An improved material.”

This material which, among other applications, is claimed to be suitable for the lining of carriages, is thus made. To use the words of the inventor, “ I propose to take a woven  
 “ fabric of cotton, or flax, or other fibrous substance, and to  
 “ coat the same with any suitable adhesive solution, after  
 “ which it is to be covered with a layer of paper on one or  
 “ both sides, and then subjected to pressure, either by rolling,  
 “ flat, or other pressure, hot or cold. In some cases, when  
 “ desirable, I propose to coat the fibrous fabric with a water-  
 “ proof adhesive solution.”

“ In lieu of sheets of paper being placed upon the fabric,  
 “ I propose, in some instances, to use a paper pulp, water-  
 “ proofed or otherwise, which is to be spread on each side of  
 “ the fabric, and then subjected to hot or cold pressure,  
 “ whereby the pulp is driven or forced into the interstices

“ of the fabric, thus forming a strong, tough and solid material.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, November 28.—No. 3191.

CRESSWELL, JOHN, and GREVES, EDWIN THOMPSON.—Hearses and funeral carriages. The object of this invention is to provide funeral equipment by which more than one corpse and party of mourners may be conveyed by the same vehicles. The patentees say, “ the hearse is thus arranged :—On the fore part of the carriage, over the front wheels, are four compartments, two one over the other, on either side ; these are closed from the side of the hearse by suitable flap doors or drapery. On the rear part of the carriage are six similar compartments, so that the hearse is of length to contain two coffins laid end to end ; the compartments on the rear part of the carriage are closed at the back. By cranking the rear axle of the carriage we obtain space for two more compartments, hung from the body of the rear part of the carriage, thus making the hearse to contain twelve corpses in separate compartments.

“ Our improvements in funeral carriages consist in adapting one carriage to the conveyance of several parties of mourners separately, and with this view we propose to construct a long carriage similar in form to an omnibus, but divided inside into two or more compartments, which can be closed by sliding doors or curtains, or in any other suitable manner. This carriage is entered from the back, a passage running up the centre, and is lighted at the sides. Seats for the bearers and attendants are provided on the outside of this carriage behind the driver’s seat.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, November 29.—No. 3202.

LLOYD, THOMAS. — (*Provisional protection only.*)—Wheels. The wheel here described is intended for use on rail or tramways as well as upon common roads. For this purpose the wheel has a flat tire but it is fitted with guide pieces which project by their own gravity as the portions of the wheel in which they are fitted come to the ground. The travel of these

guide pieces is regulated by springs and studs and the springs serve to prevent concussion.

[*Printed, 4d. No Drawings.*]

A.D. 1862, December 6.—No. 3278.

McCLINTOCK, RICHARD. — (*Provisional protection only.*) — Securing wheels on axles. The inventor thus describes his invention. “Near the outer end of the journal of the axle I  
“ remove a portion from the circumference thereof, and place  
“ a split flanged ring or stop on the portion so diminished in  
“ circumference; the halves of this ring are kept together by  
“ an elastic band, which lies in a circular recess cut on the ring.  
“ Over this ring, and on the end of the journal of the axle  
“ made square, I place a cup with a broad flange. This cap  
“ is secured by a bolt with a threaded end passing through a  
“ portion of it, and through the flange of or secured to one of  
“ the halves of the ring a nut guarded by a moveable bottom  
“ is screwed over the outer end of the bolt. The cap and  
“ stop lie in a recess hollowed out in the boss or nave of the  
“ wheel. To facilitate and ensure the fixing of the parts I  
“ sometimes cause a tongue to project from the stop and enter  
“ a hole bored for its reception in the non-removed portion of  
“ the journal. To lubricate the axle I apply an oil cup to the  
“ collar of the axle, from which the oil flows through a  
“ channel made for the purpose, and finds its way between  
“ the journal and the axle box. I prefer to form grooves or  
“ channels round the journal.”

[*Printed, 4d. No Drawings.*]

A.D. 1862, December 8.—No. 3290.

HILLIAR, JOHN.—Hinge joint. The improvements “con-  
“ sist in the manufacture or construction of a joint, hinge, or  
“ connection, by using oval or other suitable shaped tubes,  
“ such tubes having an opening or slit from end to end.  
“ This joint, hinge, or connection is applicable to folding  
“ ventilators ” &c.

“I accomplish my invention,” says the patentee, “by taking,  
“ say, two sheets or folds of wire gauze or other suitable  
“ material; the edges intended to be joined or attached to be  
“ folded over, or a beading or rod turned, soldered, sewn,

“screwed, or otherwise fixed or made or attached to such edges, so as to make each edge of greater thickness than the other part of sheet plate or board; then taking two sheets and laying them upon each other, the folded or beaded edges being to the outsides, by passing the beaded or folded edges into an oval or other suitably shaped tube by the end, the sheets, plates, or boards passing through the slit or open joint, such sheets are secured together, the beadings preventing the edges from slipping through the slit, and a hinge, joint, or connection is thus formed, which can be regulated to hold fixedly and firmly, or to allow full and free action as a loose hinge or joint by opening or closing the slit in the tube or by using a larger or smaller tube.”

“This description of open tube is useful for coach beading and many other similar ornamental purposes, and would be affixed without nails or pins of any kind, by grooving or beading the surface with a plane, and slipping the tube along the grooves or beads thus formed.”

[*Printed, 8d. Drawing.*]

A.D. 1862. December 8.—No. 3291.

HILLIAR, JOHN.—Ventilator. According to one modification of this invention a sheet of wire gauze is attached to a tube or case within which is a coiled spring, a rod passing through both spring and tube, and the spring being attached at one end to the rod, and at the other to the tube, the result being that when the parts are at liberty the spring turns the tube round the rod, which is fixed, and coils the wire gauze upon the tube. The rod is fixed in any requisite situation by means of plates or brackets, these carrying also an outer case or covering for the protection of the gauze. To the lower edge of the latter is attached a beading or rod, and with this is connected a hinge or other suitable apparatus which may form a connection between the beading or rod and the upper part of the sliding window of a railway or other carriage (for example), or of the sliding sash of a window or any other moveable article “that may be used to exclude the air or fill up the space of the ventilator when out of use.” The result of this arrangement is that on the sliding window of a

carriage being depressed the wire gauze is drawn down over the opening thus left in the door excluding dust or insects while still allowing the access of sufficient air for the purposes of ventilation. The sides of the gauze may be furnished with strips of india-rubber or other flexible material which may work in grooves or tubes provided for them at the sides of the window frame or other opening, these preserving the gauze in due position, and preventing the access of dust or insects at such sides. The invention may be variously modified, several sheets of gauze being in some cases placed upon one tube or roller; or "for the nicer gradation of ventilation," two or more tubes or rollers carrying sheets of gauze may be used and may be either brought into action separately or together, certain looped cords being employed to regulate the position of the different sheets as requisite.

[*Printed, 10d. Drawing.*]

A.D. 1862, December 19.—No. 3397.

LONGRIDGE, WILLIAM SMITH.—Rolling tires. This invention relates to the manufacture of the tires of railway and other wheels, and of sheets or plates for boilers and other purposes. In the machinery the upper roll is mounted in the usual manner, the lower roll being so mounted "that when the tyres, hoops, or rings are passed into or removed from the machines they are passed between the end of the lower roll and the side frame which carries the bearing of the roll."

One end of the lower roll is so arranged as not to reach into or up to the side standard of the machine, a space being left between them sufficient to allow the bloom for the tire, hoop, or ring to be passed into such space, and inserted between the upper or lower rolls or removed therefrom. The bearing which carries the end of the lower roll is mounted upon a moveable carriage so as to be capable of being traversed backwards away from the roll when the bloom is introduced and then returned thereto, this traversing being effected by the use of a hydraulic ram, or other suitable means, and the upper roll being raised during the introduction of the bloom. When hoops or rings of greater width than the interval of space between the end of the roll and the frame are required, the

machine is so constructed that the lower roll itself may be traversed longitudinally in order to admit of the passage of such hoops or rings to and from the rolls, the opposite end of the roll to that already mentioned being mounted in bearings placed upon a moveable carriage which may be traversed to-and-fro by the use of hydraulic apparatus.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1862, December 23.—No 3422.

PARKER, FREDERICK.—“Improvements in carriages.”

These improvements relate to “all descriptions of two wheeled carriages constructed on the principle known as” the patentee’s “registered Cambridge cart.” They consist “firstly, in connecting the shafts or front bar directly to the axle by means of steering irons or tension rods connected therewith, thus giving to the ends of the springs liberty to play along the shafts through the medium of sockets or rings passing round the shaft in connection therewith, instead of at one of the said ends only, as at present.

“Secondly, in attaching one end of the springs to the shafts by means of iron clips or bands passing round the same, in lieu of lug plates bolted through the shafts, where it may be necessary to leave one end only of the springs at liberty to play.

“Thirdly, in the employment of india-rubber, gutta-percha, or other flexible material combined with metal (instead of being entirely of iron, as at present) for forming or manufacturing the sockets or rings, through which the shafts play by the expansion or contraction of the springs when in motion.

“Fourthly, in placing and fixing the shafts at the sides of the elliptic springs, in place of passing them between the upper and lower halves thereof when found desirable, the shafts being connected or attached to the ends of the springs by either of the methods herein described.

“Fifthly, in the employment of springs of substance proportionate to the minimum weight intended to be carried in connection with auxiliary springs arranged as to be brought into play when additional weight is placed on the carriage in lieu of springs proportionate to the maximum weight as

“ at present employed, as also in placing the auxiliary springs  
“ either within the same or parallel to the ordinary springs,  
“ so that when a certain amount of weight is placed upon the  
“ carriage the ends of the upper halves of the auxiliary  
“ springs may be brought together and made to rest upon the  
“ lower halves thereof through the medium of india-rubber  
“ pads attached to the ends.

“ Sixthly, in the employment of clips or bands for attaching  
“ the upper halves of the springs to the body, and the lower  
“ halves to the axle in like manner, whereby a more effectual  
“ method of securing the same is effected than by passing the  
“ bolts through the springs as hitherto.

“ Seventhly, in the employment of bearings of india-rubber  
“ placed between the body and the upper halves of the  
“ springs, as also between the lower halves of the springs,  
“ and the axle for lessening or checking concussion, noise,  
“ wear, and tear, when in use.”

[*Printed, 4d. No Drawings.*]

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A.D. 1863, January 1.—No. 6.

FAULDS, ROBERT.—(*Provisional protection only.*)—Improvements in traction and common road engines. “ According to  
“ one modification the driving wheels are actuated by means  
“ of worms gearing with worm wheels attached thereto or  
“ fixed on the axles thereof. These worms are, by preference,  
“ upon two parallel shafts disposed horizontally and longitudinally, and driven by means of bevil gearing from a transverse shaft, or by spur gearing from a central longitudinal shaft, worked by the engine at a comparatively quick speed.  
“ Clutches, by preference of the frictional kind, are arranged  
“ in convenient positions for throwing the wheels on either  
“ side into or out of gear, and the engine or carriage can be  
“ steered or manœuvred by these means, as the driving of the  
“ wheels on one side only will cause it to turn towards the  
“ opposite side. Or the steering may be effected by means or  
“ a separate pair of wheels upon a bogie or swivelling frame,



“ in connection with which provision may be made for  
“ causing the load to bear more or less upon them.

“ According to other modifications the driving wheels may  
“ be actuated by spur or bevil gearing with clutches for  
“ throwing them separately into or out of gear; or the  
“ propelling power may be applied to one pair and be trans-  
“ mitted to the other pair or pairs by connecting rods, as in  
“ railway locomotives.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, January 7.—No. 61.

AVELING, THOMAS. — Driving traction engines. In the improved engine, “the motion is communicated through  
“ gearing from the crank shaft to the driving wheels,” which latter have on their tires central ribs for running on hard ground and lateral ribs for increasing adhesion. The patentee says, “the intermediate gearing I mount on a counter shaft, the bearings for which I form in the same brackets that carry the crank shaft. Keyed to the opposite ends of the counter shaft are spur wheels having different numbers of teeth to suit two different speeds of driving, and into these wheels gear spur pinions of varying diameter on the crank shaft. These pinions are free to slide on their shaft in order that either may be thrown into action at pleasure according to the driving speed required. They are by preference shifted by hand and kept in or out of gear, as the case may be, by the application of elastic clips composed of leather and steel which clasping the shaft at either side of the boss of the pinions, will act like a fixed collar on the shaft and maintain them in the required lateral position. The driving motion I prefer to transmit through a chain and chain pinion and wheel. The chain pinion is keyed to the counter shaft, and to allow of the slack of the chain being taken up, I set the counter shaft bearings in segment slots struck from the axis of the crank shaft. The bearings may be raised to any required height suitable for bringing the chain to tension by means of blocks and then held firmly by binding screws. For still further varying the speed it is only necessary to shift the chain pinion for one of less or more teeth.”

[*Printed, 10d. Drawing.*]

A.D. 1863, January 13.—No. 100.

LEWIS, THOMAS GEORGE.—(*Provisional protection only.*)—Improvements in perambulators and invalid carriages. “This invention,” says the inventor, “relates to the application of moveable arms to perambulators, invalid chairs, and other carriages for the purpose of holding or supporting children, invalids and other persons in such vehicles, and also to offer support or rest for the arms. For this purpose I use a frame adapted and fixed to the back of the carriage, and so as to be immediately behind the back of the child, invalid, or other person; on this frame I mount two iron rods on which are sliding sockets which slide up and down thereon, to those sockets are fitted by joints two bent arms which when moved to the backward position leave free ingress and egress to and from the vehicle, but when brought forward come across the chest or other part of the child or person intended to be supported. Binding screws are fitted to the sockets so as to permit of the adjustment and fixing of the arms at any suitable height; the same fixing may also secure the arms in their forward or backward position, or a strap and buckle or other connection may unite the arms at the front. The arms I prefer to make of metal and with a curved portion suitable for resting the arms of the child or other person, but which are suitably stuffed or padded, and covered to render them agreeable as supports. Instead of the upright bars carrying the sliding sockets being on a separate frame they may be fixed to the back of the carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, January 15.—No. 137.

BATH, JAMES PARKER.—Running gear for tram and common roads. “These improvements have for their object a simple arrangement, whereby omnibuses and other like vehicles are rendered equally available for travelling upon rail or tram ways or common high roads, and consist in suspending by joints to the under side to the axle tree of the fore carriage two short pendulous arms, to the lower ends of which are attached axletrees running parallel with the

“ main axletree on the outside of these arms, and carrying  
 “ thereon vertical revolving face plates, to the front of each  
 “ of which is secured a disc, annular ring, or wheel, which  
 “ extending a short distance beyond the ordinary running  
 “ wheels, act as a flanch for keeping the bearing wheels on  
 “ the rail. The inner ends of the axletrees on the inside of  
 “ the pendulous arms it is preferred for the sake of strength  
 “ to bend upwards and attach them to the centre of the main  
 “ axletree by a suitable joint or joints. When the guides are  
 “ in use, they are held in position by india-rubber or helical  
 “ springs attached on one side to the lower end of the pen-  
 “ dulous arms, and to the ends of cross beams or arms  
 “ extending across the main axletree. When the carriage is  
 “ required to run on the ordinary road, the guides are drawn  
 “ up (by preference) in a backward direction by means of a  
 “ ‘bridle chain’ or cord, and small windlass or their  
 “ mechanical equivalent worked by the driver or other  
 “ person.”

[*Printed, 8d. Drawing.*]

A.D. 1863, January 16.—No. 144.

KERR, JOHN.—(*Provisional protection only.*)—Brake. The  
 following is the inventor’s provisional specification:—“ My  
 “ invention relates to the retarding or stopping of carriages  
 “ either on railways or common roads by means of a self-acting  
 “ break upon the wheels of such carriages. The improve-  
 “ ments consist in connecting the ordinary buffer apparatus  
 “ (consisting of buffers, rods, and draw springs) with the  
 “ levers actuating the breaks, which may be effected by  
 “ means of levers, links, or other equivalent connections, so  
 “ that when the speed of the engine is slackened the concus-  
 “ sion or pressure of the buffers of the carriages behind shall  
 “ compress the springs, transfer the impetus of the carriages  
 “ to the breaks, and so stop the carriages. This may also be  
 “ applied to carts or carriages on common roads by connect-  
 “ ing the straps, poles, or shafts by which the animal of  
 “ draught retards the vehicle to breaks acting upon the  
 “ wheels.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, January 28.—No. 259.

MUNTZ, EUGENE GUSTAVUS. — “Improvements in securing  
“ axles and axle boxes.”

According to this invention the patentee forms upon an axle “the half section of a groove running round or partly  
“ round the axle, the counterpart of this groove being formed  
“ on the inside periphery of the box; an opening somewhat  
“ larger in diameter than the section of the entire groove is  
“ cut in the box, inclining towards the groove; this opening  
“ has a flange round the orifice, reducing its diameter at that  
“ part and forming a collar, the axle and box being fitted  
“ together with the grooves in apposition. A plug of india-  
“ rubber or other flexible material, furnished with a ring or  
“ knob at one end, below which is a projecting collar formed  
“ on the plug, is inserted into the orifice in the box, and  
“ winds itself round or partly round the groove in the axle  
“ and box, being prevented from escaping by the collar  
“ upon the plug impinging against the flange or collar formed  
“ in the opening by which it enters. The flexibility or elas-  
“ ticity of the material of which the plug is formed allows of  
“ its being withdrawn by force when required.”

The plug may be formed of annealed wire cased with vulcanized india-rubber, or with leather, yarn, or fine catgut, or it may be formed of coated wire.

[*Printed, 8d. Drawing.*]

A.D. 1863, January 30.—No. 280.

COCKER, JAMES.—(*Provisional protection only.*)—Passenger indicator for omnibuses, &c. A turnstile is placed in the doorway, or on the platform at the rear, which is in connection with a recording apparatus; the actual turnstile is susceptible of modifications for the purpose of economising space and it may if desired have a flexible bar made of a covered spiral spring, or otherwise, for the same purpose.

[*Printed, 4d. No Drawings.*]

A.D. 1863, February 9.—No. 357.

LAW, DAVID, and DOWNIE, JOHN.—Traction engines. The chief peculiarity of the engine described by the inventor, is that every wheel may if desired be used as a driving and also

as a steering wheel. For this purpose each pair of wheels, keyed on an axle is mounted in a bogie which turns about a vertical shaft. This shaft communicates to the axle by means of bevel gearing, the driving motion from the engines. The bogie itself is turned for steering by means of toothed segments, and the power for this purpose may be supplied by hand or by a donkey engine. The framing is supported on volute springs. The boiler shown is vertical and it may be supported on trunnions to preserve the water level. Brake bands are fitted to the crank discs. Power may be supplied from the engine to carriages in its train for their propulsion.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1863, February 11.—No. 378.

WYCHERLEY, HENRY.—Wings for carriages. The patentee says, “my invention has for its object the prevention of the highly objectionable vibration commonly imparted to such parts of carriages when in use, arising from the mode of attaching the same to the body of carriages above the springs, as now commonly adopted, and I effect this by attaching independent auxiliary springs, either outside or inside, above or below the springs used for supporting the carriage body, and to the ends of these auxiliary springs I form an extension that supports the wing (which may be made with or without flanges) at each end that sweeps over the periphery of the wheel, leaving about an inch and half play, more or less, between the periphery of the wheel and the under side of the screen or wing, and on the top of the auxiliary springs, immediately in contact with the axletree or in other suitable position on the same, I fix two pins screwed or their equivalents, tapped with a broad head, and over these pins a continuous support is applied attached to the wing or screen underneath the crown or highest part, or otherwise as convenient, from whence it curves down near perpendicularly, and then taking a quick curve with a suitable hole to pass over the pin or its equivalent before described, and continuing along on the top or bottom of the axletree, which may be curved or straight as desired, when another hole is formed for passing over a corresponding pin or its equivalent, and then to be curved up also as before

“ described and attached to the other or corresponding wing  
“ or screen.”

[*Printed, 8d. Drawing.*]

A.D. 1863, February 16.—No. 416.

ABEL, CHARLES DENTON. — (*A communication from Justin François Audineau.*)—Omnibus. “ This invention consists in  
“ constructing an improved omnibus, having a double body,  
“ or having two compartments fixed side by side, and pro-  
“ vided with two sets of three wheels, each set consisting of  
“ two small outer wheels, and one large central wheel, the  
“ latter being arranged to run in grooves between the two  
“ compartments of the omnibus. By this arrangement an  
“ omnibus is formed, which if of the ordinary length, will be  
“ of double the usual capacity, and yet require considerably  
“ less tractional force in proportion to the increased load than  
“ an omnibus of ordinary construction, as the wheels are so  
“ arranged that the weight is carried equally by the front and  
“ hind set, added to which the large size of the central wheels  
“ greatly facilitates an easy motion. In order to facilitate  
“ the turning or lateral motion of the omnibus, the axles of  
“ the front, and, when required, the hind outside wheels, are  
“ arranged to turn upon centres, the front central wheel also  
“ partaking of this motion. The turning of the axles of the  
“ hind wheels, when required, is effected by the motion of the  
“ front wheels by means of diagonal connecting rods hinged  
“ to the axles, similar in arrangement to those already  
“ employed for railway carriages and traction engines. To  
“ enable the outer wheels to shift their position, the points of  
“ support of the springs work in grooved or slotted segments  
“ attached to the body of the omnibus, which is also the case  
“ with the front central wheel. Both the central wheels are  
“ fixed upon short axles which run in bearings on either side  
“ of the wheel; the outside wheels turn upon their axles in  
“ the usual manner. A separate door is provided to each  
“ compartment of the body, both of which compartments are  
“ provided with two rows of seats, and are either entirely  
“ partitioned off from each other or only partially so. Two  
“ double rows of seats are arranged on the roof, to which  
“ access is gained by steps fixed at the back between the two

“ compartments. The omnibus is arranged to be drawn by  
“ three horses abreast.”

[*Printed, 8d. Drawing.*]

A.D. 1863, February 19.—No. 451.

ROBERTS, RICHARD PERCY.—(*A communication from James A. Cramer.*)—(*Provisional protection only.*)—Axle box. The inventor says, “The nature of my invention consists in the  
“ method of securing the box in the hub or nave, which is  
“ accomplished by the use of a conical or wedge-shaped nut  
“ on the end of the box, which when screwed up operates  
“ both to wedge and clamp the box in the hub or nave. I use  
“ a conical or wedge nut, a collar or flange being adjusted to  
“ fit against the flange on the box and screwed thereto by  
“ means of bolts. The heads of the bolts are on the hub side  
“ of the flange, and are somewhat sharpened and project  
“ slightly in order to catch and hold the hub or nave when it  
“ is pressed and clamped into position by the nut on the end  
“ of the box. The nut is formed conical or wedge-shaped as  
“ represented, in order that it may enter flush with the end  
“ of the hub or nave, and operate in a double capacity.

“ First, to clamp the hub or nave firmly between it and the  
“ flange at the other end of the box. 2nd, to wedge itself into  
“ the hub or nave as it is screwed up and so to hold firm and  
“ steady the box in the hub and in connection with the wedge  
“ and pointed bolt heads at the other end of the box to prevent  
“ any tendency whatever of the box getting loose, turning or  
“ working in the hub or nave. Grooves being cut in the  
“ inner shell of the box to hold oil for lubrication, the oil  
“ being injected through an orifice, it is evident that the  
“ conical wedge nut when made with an opening for the end  
“ of the axle through it may be used to fasten in the hub or  
“ nave the box of any plain ordinary axle equally with the  
“ box and axle described.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, February 24.—No. 503.

BURTON, JOHN WATSON.—Bearings. “The bearing or part  
“ on or against which the axle or shaft works is composed of  
“ glass or other similar hard and smooth material or com-

“ position, and the flanges or ends or outer ends or outer  
 “ parts are composed of brass or other suitable metal or alloy,  
 “ and there is inserted between the said bearing and the  
 “ flanges or end pieces of wood, papier maché, felt, india-  
 “ rubber, cloth, or other similar non-metallic and partially  
 “ elastic substance or material. The several parts are united  
 “ as required by means of countersunk bolts, or in any other  
 “ convenient manner. By this combination of materials  
 “ there is provided a hard and smooth bearing of a more  
 “ permanent character than those in ordinary use, resting at  
 “ each end against a kind of cushion of partially elastic  
 “ material.”

[*Printed, 6d. Drawing.*]

A.D. 1863, February 26.—No. 536.

BROWN, HENRY WALTER.—(*Provisional protection only.*)—  
 Window frames and glazing. For the purpose of preventing  
 vibration and excluding dust and water, the window frame is  
 fitted with a rib of vulcanised india-rubber held in a groove.  
 The sliding edge of the sash is provided with a groove lined  
 or not with metal, which slides on the above mentioned elastic  
 rib or bead. This bead is fitted into and held in its groove by  
 being allowed to contract after it has first been stretched till  
 it is thin enough to enter the groove.

The window sash is held in the required position by means  
 of a screwed clamping stud.

The glass, before being placed in the frame, is surrounded  
 with a fillet or band of india-rubber.

[*Printed, 4d. No Drawings.*]

A.D. 1863, February 27.—No. 554.

COFFEY, JOHN AMBROSE.—Accumulating power. The pa-  
 tentee says, “ in carriages or vehicles I connect the naves or  
 “ other revolving parts of travelling wheels with toothed  
 “ wheels, which are put in gear (when necessary) with a  
 “ spindle having similar toothed wheels or friction clutches  
 “ or other arrangements at each end capable of working with  
 “ or being entirely freed from either of the said travelling  
 “ wheels, this spindle receiving in its turn the power gained  
 “ by momentum from descending declivities, or by being



“ otherwise communicated from the reservoir of power, which  
 “ reservoir may consist of a power spring, or of a piston rod,  
 “ or other motive power arrangement, or of a pneumatic or  
 “ other compressing apparatus, or of a weight or screw  
 “ arrangement, whereby such arrangements become in effect  
 “ reservoirs of power. The controlling locomotion by  
 “ stopping, retarding, or starting may be effected by acting  
 “ on the mechanism aforesaid, by means of a handle or lever  
 “ acting on the spindle aforesaid and commanding the  
 “ toothed wheel, or friction clutch, or other gear, so that it  
 “ can be thrown into gear on each or either side, and com-  
 “ municate the power to or from the spring or reservoir  
 “ aforesaid, and cause the carriage or vehicle, or vessel ‘to  
 “ ‘move’ forwards or backwards or to one side or the  
 “ other.”

[*Printed, 10d. Drawings.*]

A.D. 1863, March 6.—No. 643.

NEWTON, ALFRED VINCENT.—(*A communication from Seth Woodbury.*)—Elastic wheel. “ The felloe proper is constructed  
 “ in any well known and approved manner, and properly  
 “ connected with the spokes, and its periphery is covered by  
 “ a ring of vulcanised india-rubber or an equivalent elastic  
 “ material. The felloe being thus coated, a steel or other  
 “ metal tire is shrunk on so as to compress the elastic  
 “ material, and screw bolts are passed through the tire and  
 “ felloe at suitable distances apart, and secured by nuts at  
 “ their inner ends. This tire serves to protect the belt of  
 “ elastic material from wear, and being shrunk on to an  
 “ elastic bed it will yield sufficiently to inequalities in the road  
 “ surface over which it rolls to attain the results above  
 “ indicated.”

[*Printed, 6d. Drawing.*]

A.D. 1863, March 9.—No. 650.

HAWORTH, JOHN.—(*Provisional protection only.*)—Brakes  
 The following is the provisional specification:—“ My inven-  
 “ tion consists in applying a metal clip, lined with leather  
 “ or other suitable material, for increasing the friction to  
 “ the nave of one or more of the wheels of the omnibus or

“ other carriage, and in connecting the two ends of the clip  
“ to a double lever, which is in communication with a treadle  
“ or handle. I prefer to use a treadle which slides in a guide  
“ in front of the driver, and which is connected by a chain  
“ and guide pulleys to a lever on the same axle as the double  
“ levers above referred to, which are thus made to apply the  
“ break or release the wheel, according to the direction in  
“ which the treadle is moved. The connection may however  
“ be considerably varied. In order to prevent the wearing  
“ of the joint pins connecting the friction clip to the double  
“ lever, I place a tube of vulcanized india-rubber over the  
“ joint pins. The friction clips are held out of contact with  
“ the naves of the wheels when the breaks are released by  
“ double-headed studs passing through the clips and the  
“ leather or other material with which they are lined; these  
“ studs have washers of india-rubber or other elastic material  
“ acting like springs. When the break is on, the washer is  
“ compressed to allow the friction clip to act on the nave of  
“ the wheel, but, when the break is released, the spring  
“ washer expands and lifts the friction clip out of contact with  
“ the nave.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, March 9.—No. 656.

GORST, JOHN RICHARDSON.—Suspending carriages on wheels. This invention “has for its object the construction of carriages in such a manner as to facilitate their draft by the use of wheels of increased diameter, and to admit of the centre of gravity of the carriage being lower than usual. For this purpose the shank of the axletree is lengthened as required, and is made to form (either with or without the aid of a pieced crank) a fixed vertical guide for a grooved slide, which carries a box in which the upper part of the said shank is inclosed in such a manner as to give stability to the said shank, and prevent the box and slide from moving thereon in any but a vertical direction to an extent limited by the length of the slot in the box and by fixed stops. The upper part of the shank of the axletree where the axle is inserted is strengthened by two side pieces which fit the hollow space in the box, and are brought in

“ contact with the said fixed stops as the box is pressed  
“ upwards to its extreme height by the springs, or down-  
“ wards by the weight on the body of the carriage. At the  
“ lower end of the shank of the axletree there is a cross  
“ piece or crutch, to which is or are fixed a spring or springs  
“ which extend to a corresponding cross piece or crutch at  
“ the bottom of the shank on the opposite side of the car-  
“ riage. This spring or springs is or are intended to take the  
“ smaller weight (that is to say) the weight of the unloaded  
“ carriage. And there are two side springs (one on each side  
“ of the carriage) fixed at their ends to the body of the  
“ carriage, and bolted in the middle to a cross piece fixed on  
“ to the shank of the axletree, which springs are intended to  
“ take any greater weight put upon the carriage; or there  
“ may be two springs on each side fixed between the bottom  
“ plate of the said box and the said cross piece for the same  
“ purpose.”

[*Printed, 10d. Drawing.*]

A.D. 1863, March 11.—No. 666.

WILSON, HENRY.—Shaping spokes, &c. “ A bed somewhat  
“ similar to that of a planing machine is set upon a frame,  
“ so as to be capable of to-and-fro motion thereon. At the  
“ further end of this bed are fixed five blocks or puppets,  
“ which carry spindles free to revolve simultaneously, and at  
“ the same speed upon motion being communicated to them  
“ by toothed gear. The bed is slotted, and carries at the  
“ opposite end a frame, having formed in a piece with it five  
“ puppets in a line with those before mentioned. Each  
“ carries a spindle. The slots enable the movable puppets to  
“ be approached to or receded from those which are fixed.  
“ The central spindles have fixed between them the metal  
“ spoke serving as the pattern, to which the blanks mounted  
“ between the remaining spindles are to be cut and shaped.  
“ The bed is made to travel to-and-fro under the cutters, to  
“ be presently described, by means of a threaded shaft running  
“ the length of the frame, and engaging into a nut under the  
“ table. The table is capable of being put out of gear with  
“ the shaft by turning a wheel or lever at the front of the  
“ table connected to the nut, so as to disengage it. A rack is  
“ fixed under the table at one side, to enable it to be moved

“ to-and-fro by a hand wheel, on the shaft of which a toothed  
 “ wheel gearing into the rack is fixed. Two standards carried  
 “ up from the sides and near the centre of the frame carry  
 “ the axis of levers, the arms of which carry a steel shaft  
 “ provided with cutting tools or chisels. These tools are set  
 “ to act upon the four wood blanks fixed between the puppet  
 “ spindles; when at work this cutter shaft is driven by belt  
 “ or other suitable gearing at great speed. A tracer shaft is  
 “ fixed above the cutter shaft; it carries a guide or tracer,  
 “ which rests upon and is acted on by the metal pattern  
 “ spoke. These shafts and the arms of the levers are con-  
 “ nected through the opposite arms with levers carried under  
 “ the frame to which shifting balance weights are adapted  
 “ to counterbalance the weight of the cutter shaft, tracer  
 “ shaft, and parts connected with them. The blanks and the  
 “ metal pattern spokes being properly fixed between the  
 “ puppet spindles, and all the parts being in gear, the bed  
 “ moves to-and-fro under the rapidly rotating cutters.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1863, March 11.—No. 669.

BARCLAY, ANDREW.—Traction engines. “ This invention  
 “ relates in the first place to certain improvements in the  
 “ construction and arrangement of traction engines, which  
 “ improvements are based upon an invention of a similar  
 “ kind for which letters patent were granted to Mr. A. Bar-  
 “ clay, dated 10th March 1862, No. 646.

“ Under one modification of the present invention as applied  
 “ to traction engines of the ‘right-angled class,’ the crank  
 “ shaft of each pair of engines has its bearings at one end  
 “ arranged in the side standard or frame whilst the other end  
 “ is connected to the main axle or to the centre of the  
 “ driving wheel, so that this end of the shaft vibrates with  
 “ the motion of the spring of the driving wheel, whilst the  
 “ other end remains a fixture in its bearing. The other pair  
 “ of engines have their crank shaft arranged in like manner,  
 “ the fixed bearings being on opposite sides of the machine.  
 “ In this way the vibratory motion of the wheels as they  
 “ traverse over the inequalities of the road is imparted to one  
 “ extremity of each crank shaft but without affecting the  
 “ opposite ends, which revolve steadily in their bearings.

“ The object of the arrangement is to prevent the vibration  
“ of the driving wheels from affecting the beat of the valves.  
“ The driving wheels are arranged one with a long tubular  
“ axle to which the wheel is keyed and extending across the  
“ framing, the other wheel is fitted with an axle which passes  
“ through the tubular one and is fastened by a nut. Or the  
“ two axles may be arranged parallel to rotate in contact,  
“ and thus obtain an extended bearing surface when the  
“ engines are driven at different speeds. The traction engine  
“ is coupled to the vehicle accompanying it by a T-shaped  
“ connecting piece which is carried on a vertical spindle, its  
“ prolongation passing through two bushes carried by the  
“ framing of the connected carriage, the hind wheels of  
“ which are connected with the engine by means of a shaft  
“ and wheels or by connecting rods direct, so as to angle  
“ along with the engine when going round a curve. This  
“ arrangement admits of the lateral and vertical movements  
“ of the coupled engine and vehicle. The traction engine  
“ may also be guided as well as regulated in speed by means  
“ of a duplex break action which is operated by a single hand  
“ lever, so that the motion may be checked or the break  
“ applied to either side of the machine and so guide it by the  
“ different speeds of the driving wheels.”

[*Printed, 10d. Drawing.*]

A.D. 1863, April 1.—No. 837.

BRAY, JOSEPH. — Omnibuses, &c. The patentee constructs  
“ omnibuses, railway carriages and other vehicles in the form  
“ of two storeys, and ” makes “ a suitable staircase either  
“ inside or outside of the carriage to ascend to the upper  
“ storey.”

The seats may be either back to back or face one another.

[*Printed, 10d. Drawing.*]

A.D. 1863, April 10.—No. 906.

COUPERIE, SAINTE AURE.—“ A semicircular metallic slide  
“ whereby the pole bolt is effectually suppressed, and which  
“ can be added to every four wheeled vehicle.”

This “slide” is made up of two semicircular plates, on one

of which is a dove-tailed rib which fits into a groove in the other. Lubricators are provided for the reduction of friction.

[*Printed, 8d. Drawing.*]

A.D. 1863, April 13.—No. 926.

ROLFE, ALFRED.—(*Provisional protection only.*)—Propelling “vehicles.” The inventor arranges “on a carriage, suitably constructed for the purpose, a wheel or wheels of proper size, which are mounted on frictionless bearings, and are actuated (by preference) by men working the handles or cranks attached to these wheels, though steam or air engines or other means may be employed for this purpose. These fly wheels are connected by means of endless bands or straps with a series of one or more wheels suitably mounted on the framing carrying the fly wheel or wheels, and are finally connected (by means of fast-and-loose pulleys on the axle) with the wheels running on the road, and to which the power is thereby imparted. In working the apparatus, when the time arrives for stopping the train or carriages the strap connected with the driving wheel is shifted on to a loose pulley from the pulley which actuates these wheels, and when there, instead of the men or other power working the levers stopping the fly wheel, they continue it at work, and the power so obtained is accumulated by the fly wheel until required when starting the train, when on the strap being shifted to the fast pulley the carriage will be at once propelled forwards. When required to stop the carriage brakes are applied in the ordinary manner, or they may be so adapted as to cause the power wasted in the act of ‘braking’ to be transmitted by suitable gearing to the fly wheel or wheels. When required to reverse the carriage, the fly wheel may be stopped and the fly-wheels reversed by working them backwards, or the wheels may be continued in the same direction and the motion may be reversed by having crossed straps working on fast-and-loose pulleys, so that the pulleys work different ways on the straps being shifted, as is well understood.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, April 18.—No. 975.

BURDEN, WILLIAM BENONI.—(*Provisional protection only.*)—Wheels and axles. The inventor proposes “to form the arms of the axles of carriage wheels, or of other axles whereon the wheels revolve, in such manner that they shall be horizontally at right angles to the centre line of the carriage fore and aft, or to the line of progress, the same being vertically declined to the extent by preference of seventeen degrees and three-fifths or thereabouts, or not less than nine nor more than 25 degrees. The wheels are to be so constructed that as they revolve on level ground each spoke, or the medium line of spokes, shall be vertical, notwithstanding the vertical declination of the axle, so as to have an upright bearing under the axle, the tires, if flat, being horizontal on the ground, but they may be convex or of other sectional form. For locomotives or for railway carriages, where the wheels revolve fixed or keyed on their axles, so that their axles revolve with them, the faces of the wheels are to be horizontal on the rail, the centre line of each axle being vertically declined, as before described, the bearings of the spokes between the tires and the axles being upright, whether the faces of the wheels are horizontal or otherwise on level rails.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, April 21.—No. 991.

NOTTINGHAM, JOHN WILLIAM. — (*Letters Patent void for want of Final Specification.*)—Improvements in Hansom cabs. These improvements consist, firstly in widening the body by disposing the springs beneath the extended parts, secondly, in making the doors of nearly the full width of the vehicle, and in making each leaf of the door in hinged parts so that they may be folded back, or over the wheels to serve as dress guards; thirdly in making the head separate from the body, and mounted on a pivot so that it may be lowered over the body to make an open vehicle; fourthly, in furnishing the head with shutters or blinds of wood or metal laths, with or without glazed slots; and lastly in supporting the driver's

seat upon a transverse spring, which may also serve as an additional support to the cab body.

[*Printed, 4d. No Drawings.*]

A.D. 1863, April 25.—No. 1035.

BRUET, LOUIS ALEXANDRE JOSEPH.—Indicator and register for carriages. “A suitable external sign is placed on the front  
“and top of the case of the mechanism or driver’s box for  
“indicating that the vehicle is disengaged or not hired; but  
“when a fare is taken, the driver turns a handle a quarter of  
“a circle, causing thereby the external sign to be lowered and  
“to disappear, and at the same time to actuate the gearing  
“required for the motion of the apparatus or mechanism of  
“the distance index. The handle in turning performs three  
“separate operations. The first indicates that the vehicle is  
“not hired; the second or the first turn of a quarter of a  
“circle the vehicle driving or hired by the mile, that is to  
“say, the distance run over, to which may be added the time  
“of the stoppages represented by the mean proportions of  
“distance (calculated at about five miles per hour); the third  
“operation indicates the slow motion of the vehicle, that is to  
“say, that independently of the velocity of the vehicle the  
“mile or distance index will constantly indicate a mean  
“velocity of the vehicle when in motion and its stoppages. By  
“this means only one tariff per mile for all cases is required.  
“When the fare leaves the vehicle the handle is returned to  
“its rest mark, the mileage index hand returns to 0, and  
“the external sign appears. All these operations shown to  
“the fare or traveller are written or marked on an internal  
“plate or dial, and also the time of each of these operations.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1863, May 2.—No. 1102.

GIBSON, JOHN WILLIAM, and TURNER, WILLIAM.—(*Provisional protection only.*)—Springs for buffers and drawhooks and “carrying springs of railway carriages and other  
“vehicles.”

“These improvements relate to the employment for the  
“above-mentioned purposes of volute springs or bars of



“ steel, or their equivalents, in connexion with the arrangements, herein-after described, for twisting or winding up such springs or bars of steel, thereby affording the requisite power of resistance. When applied to a railway buffer” the inventors propose “to adopt the following arrangements: —The volute spring is secured at one end to a central pin (secured to the carriage frame or adjuncts thereof) and at the other to the inner circumference of a pulley drum, the outer circumference of which has a rope chain, or cord connected thereto, and passed over the same, and over a sheave (connected to the inner end of the buffer rod), the other end of the rope, chain, or cord being connected to the guide or to the carriage frame. The buffer rod being driven in, causes the volute spring to be acted upon by the action of the rope, chain, or cord that passes over the said sheave as aforesaid, which is acted on by the motion of the buffer rod, giving a resistance against the buffer equal to twice that of the spring; it may, however, be used direct, if preferable.

“ For draw-hooks the arrangements are similar to the above, but the springs and boxes being contained in the same frame or casting, the strain is divided between them, and not discharged on the carriage frame, unless in the case of an end carriage, which has only to bear a pull on the frame equal to its own weight. For other springs, such as bearing springs, the arrangement is similar also, but two or more springs may be used if necessary.

“ For the steel bar arrangement,” the inventors “prefer to use bars of flat steel, one end being secured to the carriage frame and the other to the drum or pulley acted on by the rope, whereby sufficient twist or resistance is obtained.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, May 2.—No. 1106.

DUBREUIL, JEAN BAPTISTE.—(*Provisional protection only.*)—Weighing apparatus for carts, &c. The inventor says, “I form a skeleton framework or under framing on which rests loosely the body of the cart or waggon. To said under framing I adapt a V-shaped lever, or two levers each bent outwards at their outer ends, which are formed forked, said forked parts resting each upon a knife edge piece of

“ metal fixed to the under framing aforesaid, the inner ends  
“ of the arms of the said V-shaped lever have a piece of  
“ metal affixed thereto, the upper side whereof is formed with  
“ a knife edge, and the under side thereof is concave and this  
“ concave part is acted upon by the knife edge of another  
“ piece of metal constructed and arranged as follows:—To  
“ the side of the under framing aforesaid and at a short distance  
“ from the centre thereof an upright piece of metal is  
“ fixed, same being forked at top to receive the fulcrum of a  
“ steel yard or graduated lever. This lever has an arm  
“ formed thereon which descends to the under side of the  
“ under framing aforesaid, at which point it is bent. This  
“ arm carries at or near its end a knife edge, which comes  
“ underneath the concave surface before mentioned. The  
“ upper edge of the bent forked parts of the aforesaid  
“ V-shaped lever are each formed with a knife edge corresponding to concave-shaped pieces of metal fixed to the  
“ under side of the body of the cart or waggon, and another  
“ concave piece is placed opposite to the knife edge situate at  
“ the inner ends of said V-shape lever as before stated at a  
“ considerable distance from the fulcrum of the steel yard  
“ lever before mentioned, and to the outside of the aforesaid  
“ under framing I fix a standard into the upper end of which  
“ a metal point is fixed. I also fix a similar pointed piece of  
“ metal on the long arm of the steel yard and adjust sliding  
“ weights thereon. A weight is adjusted on the short horizontal  
“ arm of the steel-yard lever aforesaid, said weight  
“ balancing the weight of the body of the cart or waggon.  
“ When empty, said body fits loosely upon the under framing  
“ which supports same, so that supposing said body to have  
“ goods placed therein, the weight of said goods may be  
“ ascertained by sliding the smaller weights on the long arm  
“ of the steel-yard lever aforesaid until the points before  
“ referred to come opposite to each other, the body of the cart  
“ or waggon being lifted by the knife-edges on the V-shaped  
“ lever before mentioned.”

[Printed, 4d. No Drawings.]

A.D. 1863, May 6.—No. 1128.

WARD, JAMES TOWNSEND. — (*Provisional protection only.*)—  
“ Improvements in carriages.”

The inventor says, "My invention consists, firstly, of the following improvements in four-wheeled carriages:— I make the body of the carriage of the form of the carriage ordinarily called a wagonette, the said body of the carriage being provided with moveable raised backs to the seats. I provide a cover for the carriage, which cover being placed upon the body and fixed temporarily thereon converts it from an open to a close carriage. The said cover has a seat in front which will accommodate four persons, and is railed round at the top so as to fit it to carry luggage. The said cover is provided with windows. As the moveable high backs to the seats are not required when the cover is used to the carriage, the said backs are removed before the cover is put on.

"My invention consists, secondly, of a folding or collapsible luggage basket. The said folding luggage basket is fixed under the body of the carriage, the axle of the hind wheels being suitably cranked to make room for it. The said folding basket is made of a series of parts so hinged together that the basket, when not required to carry luggage, can fold or collapse into a frame or recess on the under side of the body of the carriage, to which the upper edge of the basket is fixed. When required for use, the basket is allowed to expand downwards and the luggage to be carried is introduced at the hind part."

[*Printed, 4d. No Drawings.*]

A.D. 1863, May 8.—No. 1158.

BIELEFELD, CHARLES FREDERICK.—Sheets and slabs. The patentee says, "I take woven or other suitable fabric, such as fabrics of woven cocoa-nut or other fibres, felt, paper, dry hair felt, and such like and I thoroughly saturate the same with a compound of water glass (soluble silica), clay, and lime, with or without metallic oxides. The proportions I prefer are as follows:—1 lb. clay, 1 lb. lime, 1 lb. pumice stone 6 lbs. pulp, 8 lbs. water glass. I also make a plastic material composed of same, but adding a quantity of paper pulp or other like material in about the following proportions:—2 lbs. of a mixture composed of equal parts of clay, lime, and pumice stone, 8 lbs. of water glass, and 2 lbs. of pulp, which is trowelled over the pre-

“pared pieces of fabric, filling up the interstices of the fabric. Where greater thickness is required, I place two or more thicknesses together, and guage or trowel the surfaces to the thickness or purpose required. I also make thick boards by the like mixtures with paper pulp in a very fluid state. The mixture must be kept in motion in order that it may become thoroughly incorporated. It is then poured into frames according to the thickness required. To the bottom of the frame I fix either gauze wire or perforated metal.”

“These sheets are applicable to a great variety of purposes, amongst others, to railway and other carriages.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, May 18.—No. 1240.

CHRISTMAS, ELEAZAR.—Improvements in carriages. This invention consists “1st. in making the bottom side plates of carriage bodies of angle iron, and laying the ends of the bottom boards in the angle, so as to form a level floor from side to side of the carriage.

“Secondly, in fitting under the bottom boards, in a suitable recess, a platform folding or otherwise, to draw in and out at the sides of the carriage, so that when drawn out to be level with the top of the bottom boards of the carriage at the top, and to extend to the ground if desired; this platform is supported when opened out by joints or rigid rods, connected to the standing and hinged pillars of the carriage body, so as to form an ascent to be used in lieu of the ordinary step; or when extending to the ground to form an incline, upon which an invalid, or a garden chair with the invalid in it, can be wheeled or pushed up into the carriage at the sides, either through the ordinary or an enlarged doorway. The ordinary carriage seat is made removable, and the garden or invalid chair takes its place. When the platform is not required, an ordinary step can be attached to the under side of the angular iron bottom side frames, as before described.”

The patentee further says—“The folding steps, which also form one of my improvements I intend to be used when the platform is removed or closed or not required. This

“ step is fitted to the improved side plate or frame, and made  
 “ so that it can be lowered and raised by opening and closing  
 “ the door. In the improved invalid carriages I propose to  
 “ so fit these improved steps that when the platform is in use  
 “ (and consequently the steps are not required) the mooring  
 “ parts can be disconnected from the door, and the steps  
 “ remain in their closed or folded up condition, and in which  
 “ condition the step and supports are parallel with and close  
 “ to the under side of the carriage or recess bottom or nearly  
 “ so.”

[*Printed, 1s. Drawing.*]

A.D. 1863, May 21.—No. 1280.

GOODMAN, JOSEPH.—Velocipedes. The patentee says, “ My  
 “ improvements in velocipedes consist in connecting treadles  
 “ and hand levers to the cranked axle to which the main  
 “ wheels of the carriage are fixed, and in arranging handles  
 “ to the hand levers, which through chains or cords com-  
 “ municate with the fore carriage in which the guide wheel is  
 “ fitted, and turn it in any direction required for guiding the  
 “ carriage.

“ My improvements also consist in mounting the axles of  
 “ the guide wheel ” in horizontal grooves or slots “ made in  
 “ or applied to the sides of the fore carriage.

“ My improvements in wheels consist in the following ar-  
 “ rangements:—I introduce the outer ends of the spokes in  
 “ the felloe, where felloes are used, or directly in the tyre. I  
 “ form the hub or nave in two parts, one consisting of a ring or  
 “ collar, or flange carrying an inclined ring, which is inserted  
 “ under the inner ends of the spokes, and of an outer ring or  
 “ flange. The driving in of the inclined or conical ring  
 “ tightens up the spokes, and the parts of the nave are  
 “ secured by screws or bolts.”

[*Printed, 8d. Drawing.*]

A.D. 1863, May 25.—No. 1309.

BONNEVILLE, HENRI ADRIEN. — (*A communication from Charles William Hine Sargent.*)—Invalid carriages. This in-  
 vention consists in connecting the front with the rear part of  
 the body by means of hinges, so that the former may be swung

on one side in order to afford easy access to the interior. A moveable prop is fitted to the fore part to preserve the equilibrium of the vehicle when open. The seat is capable of being raised or lowered by screws and winches, and there is a moveable step.

[*Printed, 10d. Drawings.*]

A.D. 1863, May 25.—No. 1310.

LEPROVOST, PAUL.—“Certain improvements in carriages and vehicles for railways and other roads.”

This invention consists in constructing railway carriages and other vehicles “chiefly of sheet iron, with an external or “internal passage either nearly all round the outside, or in “the interior of the vehicle,” there being in the centre of the vehicle a spiral staircase by which the passengers may ascend to the roof, which is provided with seats and a covering, and “may be furnished with Venetian shutters to protect the “passengers from the heat or cold, as the case may be,” this covering being rounded so as to adapt the carriage for passing under tunnels. At each end of the carriage are steps and a platform, giving access to the doors, and the body of the carriage is divided into three compartments communicating with each other by means of sliding doors. On each side of the carriage is a small folding table, and on the platform at one end of the carriage is a watercloset, access to which is attained by means of a door and steps, the latter being lowered and raised by the opening and shutting of the door. Passengers may leave one carriage and enter another if desirable by means of iron flaps which are hinged to the ends of the carriages, and can be raised and lowered at pleasure.

[*Printed, 10d. Drawing.*]

A.D. 1863, June 10.—No. 1447.

CLARK, WILLIAM.—(*A communication from Casimir Noël.*)—Propelling vehicles. The general principle of the invention consists in placing the axle connecting a pair of wheels not through the centres of the wheels, but through points some inches from such centres. Then to each pair of wheels on the same side is attached a connecting rod, the journals of which are also out of centre on the diametrically opposite side of the

wheel centre. The propelling person sits astride of a beam, and by allowing his weight to rest alternately on the treadles fitted to the side connecting rods and on the beam, causes the vehicle to progress.

Various modifications of this principle are described. Cranked axles and cranks may be used instead of placing the axles and pivots out of centre. The vehicle may be steered by means of a disconnected fore carriage, or by jointing the side rods, so as to allow of the radial action of the wheels. A hand barrow worked by hand levers is also shown.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1863, June 16.—No. 1509.

FRASER, ALEXANDER JOHN.—Window fastenings. This invention consists, in the first place, in the use of a ratchet toothed rack, which may be applied to the inside of a window frame, this rack extending from top to bottom of the sash, and the horizontal part of each tooth being upwards. On the window sash is a spring bolt, which is placed so as “to abut its end against the rack, and by the pressure of its spring is kept up thereto, and is at the same time free to recede.” The effect is that on raising the sash “the bolt slips over the inclined faces of the teeth freely, catching at each one, and preventing the sash again descending from any intermediate distance to which it may be raised, or at full height. Thus, in opening a window, it is simply necessary to lift the window to the required height. If it is desired to lower, it is simply necessary to withdraw the bolt from contact with the rack teeth, and lower it down. When closed a hole is provided in the rack at that point to receive the end of the spring bolt, which shoots into such hole and prevents the window from being again raised until the bolt is withdrawn, which of course can only be done from the inside.” If it be desired that the window shall be capable of being opened and remain open for a few inches only without the possibility of its being further opened from the outside, another bolt is placed at the top of the sash, and so arranged as to be moved at pleasure into one of the several holes formed to receive it, or a cross latch may be applied to the spring bolt. By these arrangements the counterbalance weights and boxes usually applied to windows may be dispensed with, although the

patentee recommends that very heavy sashes should be partially counterbalanced. Instead of the ratchet teeth being upon the framing and the bolt upon the sash, their positions may be reversed, and the bolt in that case operated by a handle or key.

Another part of the invention consists in the employment of a rack having teeth similar to ordinary spur gear, or, by preference, "teeth with semicircular tops and bottoms," a wheel or rotary catch being in gear with this rack, and such wheel being mounted on a spindle in the window frame, a pendant arm or pawl taking into the teeth of this wheel and forming a kind of escapement thereto, permitting the rotation of the wheel in one direction, in which direction it is turned by the rack when the window sash is raised, but preventing the retrograde movement of the wheel, and consequently the descent of the sash until removed from contact with the wheel, which is effected by the use of a "thumb knob" provided for the purpose, a second catch being so arranged that if necessary it may be made to act upon the wheel and prevent the window from being opened. In order to secure the window in any given position when opened, a certain catch is provided, which may act upon the pendant arm or pawl, and keep it in the teeth of the wheel as long as desired.

In addition to these arrangements, the weight of a heavy sash may be partly counterbalanced by the use of a spring which is coiled round the axis of the wheel, "which spring in coiling itself up, assists in sustaining the weight of the sash."

The invention is described under various modifications, some of which are applicable to windows of railway and other carriages, india-rubber being used in these cases to render the window "weather tight," and prevent rattling of the sash.

[*Printed, 1s. Drawing.*]

A.D. 1863, June 19.—No. 1538.

MOREL, AUGUSTIN.—Traction engines. The patentee says:  
"The fore part of my improved engine will be made so that  
"it may turn on itself while still acting as motor, and during  
"such movement the wheels of the hind part will remain  
"motionless or roll forwards or backwards at will. I propose



“ to obtain these manœuvres by the aid of a double cylinder  
“ steam engine turning always in one direction, and which by  
“ means of bands and pullies mounted on the axles will trans-  
“ mit motion to the wheels of the traction engine. The steam  
“ engine may continue to work while the driver directs or  
“ manœuvres in any sense, because he will throw the bands  
“ on or off the pullies at will by means of other tangential  
“ pullies which will stretch or loosen the bands according to  
“ requirement by a slight up or down movement; inverse or  
“ contrary movements will thus be obtained at pleasure and  
“ without effort as the tangential pullies will be counter-  
“ balanced. When the bands are not working, they will rest  
“ on supports in order to avoid their adhering to one or other  
“ of the pullies. The driver will be placed on a seat in front  
“ of the engine, so that nothing may impede his view, and  
“ will always hold the guide in hand, as if it escape him the  
“ machine would immediately stop because the steam distri-  
“ buting cock would shut, and the band which is to come into  
“ play for the back motion would be stretched and act at the  
“ same moment as a break; in the same way should, the  
“ driver attempt to back his machine with unreasonable  
“ rapidity, the guide drawn with too much force towards him  
“ would shut the steam cock. It will result from this method  
“ of transmitting motion by bands, that the driving gear itself  
“ will oppose any too abrupt impetus given to the machinery,  
“ the bands will slide and cause the machine to move easily  
“ and without shock, and the same effect will be produced  
“ when it is desired to stop suddenly, but any other means of  
“ transmission may be employed. I propose mounting my  
“ improved traction engine on springs. The generator I  
“ propose placing upright, so that the water therein contained  
“ may have little motion, and I also propose to pass length-  
“ wise through the interior of the generator several tubes so  
“ arranged that they may be heated by lamps burning petro-  
“ leum, each tube filling as it were the office of a lamp glass.  
“ These lamps will be placed low and beneath the generator,  
“ and be fed by a reservoir of oil placed in any part of the  
“ machine.

“ As my improved traction engine is intended to run on  
“ unpaved ways as well as ordinary roads, and also to be used  
“ in agriculture, I propose to mount it on wheels of large size,

“ and to place the machinery as well as the generator as low  
 “ as possible.

“ I propose to make the tyres of the wheels with or without  
 “ inequalities or roughing, according to the nature of the soil  
 “ over which the machine is to travel.”

The water is taken from the tank to the boiler by means of compressed air, which air may also be used to work the brakes.

[*Printed, 10d. Drawing.*]

A.D. 1863, June 20.—No. 1550.

PETERSON, CHARLES.—Composition for carriage panels, &c.

The patentee says, “ I propose to take any vegetable substance or fibre, and to boil it in a solution of caustic alkali, after which it is to be ground to a pulp. I also take a quantity of tar, pitch, or other bituminous substance, and boil it with about half its weight, more or less, of caustic alkali for several hours, after which I mix it with about double its weight of the vegetable pulp prepared as before described, adding to the mixture about ten per cent., more or less, of sulphuric acid or alum, or of both combined, or any other suitable powerful chemical re-agent. When this composition is to be used for finer or superior purposes, I propose to mix with it a small quantity of flour, or other vegetable or farinaceous dust, whereby a smooth surface will be produced on the material, which may then be painted, lacquered, varnished, polished, or beautified in any other way. The application of pressure under heat is necessary to form the material into shape, after which it will harden. The admixture of the farinaceous dust renders the material less harsh and more plastic ; it is then suitable for fine work, such as cornices and picture frames.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, June 25.—No. 1603.

KIRRRAGE, WILLIAM.—Cloth for floors, roofs, &c. This fabric, which is claimed to be useful for covering carriages as a substitute for leather, is made, to use the words of the inventor, as follows:—“ I manufacture floor and other cloths by employing various substances, such as india-rubber, gutta-

“ percha, various gums, farinaceous, fibrous, or any other  
“ suitable vegetable matter, which I amalgamate in a warm  
“ state in a masticator, driven by steam in the usual manner,  
“ by first putting in the india-rubber and the gutta-percha,  
“ next the sterine pitch, and well incorporating them, to  
“ which I now add as much vegetable fibre as will make it  
“ form a strong felt. Then I add the farinaceous matter (and  
“ preferring the outside husks from ground rice) in propor-  
“ tions of about five pounds in weight to one pound of india-  
“ rubber forming a plastic body of such substance as may be  
“ rolled into any lengths or moulded into any shapes that may  
“ be required, and can then be painted or printed to the most  
“ elaborate design, or the colours worked into the body of the  
“ material to give it the required tint. The novelty of this  
“ invention consists in the great strength obtained by this  
“ mode of mixing, which prevents its cracking, and giving it  
“ an improved surface, light, warm, and impervious to damp,  
“ which qualities combined have never before been accom-  
“ plished.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, June 26.—No. 1611.

GEDGE, WILLIAM EDWARD.—(*A communication from Charles Imhoff.*) — (*Provisional protection only.*) — Placing tyres on wheels. The tyre is seized by hooks suspended from the end of a lever swinging horizontally and vertically on a pivot. The tyre, when so held, may be moved and otherwise dealt with. When it is desired to fit the tyre to the wheel, it is swung into position over the latter, which lies horizontally in a frame. The wheel has attached to it a number of inclined guides, and as soon as the tyre is released from its support by the withdrawing of the hooks, it falls sharply on these guides, and is by them conducted to its place round the wheel. The wheel is then secured in its frame, and removed for any other treatment that may be necessary.

[*Printed, 6d. Drawing.*]

A.D. 1863, June 27.—No. 1617.

HUGHES, EDWARD THOMAS.—(*A communication from Edmund Blodget Jucket.*)—(*Provisional protection only.*)—Connecting

axles and naves of wheels. This invention relates primarily to various methods of coupling hose pipes, but is partly applicable to the above mentioned purposes. The applicant says that in one "arrangement the two necks of a double coupling" are inserted in the ends of the two pieces of those which are "to be coupled together. The outer end of one neck is enlarged and fits a socket in the other neck. In the socket part are hung one or more levers having inclined sides, which levers are acted on by projections or cams on a ring fitting the two ends of the coupling. Around the part which fits the socket is formed a groove having one of its sides inclined to correspond with the inclination of the sides of the levers. In order to unite the two parts together, the socket part is placed over the other part, and the ring is turned so that its projections shall act on the levers and force their inclines into the groove before mentioned, and force the end of one part of the coupling in close contact with the other part, or with any packing that may be placed between them. This arrangement is applicable to wheels and axles. The socket is placed on the nave or axle, and the other part made to fit it, and be acted upon by a ring and levers similar to those just described."

[*Printed, 4d. No Drawings.*]

A.D. 1863, June 30.—No. 1628.

RICHARDS, ALEXANDER KEENE.—Ordnance and projectiles.

Part of this invention relates to the construction of a gun carriage, with improved wheels. These wheels have tubular spokes, which at one end are attached to the nave by a **T**-piece and a holding ring passed over the ends of the **T**'s on each side of the nave, and at the other to the felloes in the following manner. Each felloe has at its ends a projection forming one half of a clip. When put together two of these projections grasp the end of a spoke. A ferrule is then put round the whole and a securing pin passed obliquely through the felloe and the joint to secure all. An india-rubber tyre is put round the wheel in a square channel.

[*Printed, 2s. 6d. Drawings.*]

A.D. 1863, July 1.—No. 1632.

WILLIAMS, THOMAS.—(*Provisional protection not allowed.*)—  
Propelling vehicles.

This proposed method of propulsion consists in the utilization of manual powers by means of levers which work cranked axles on which are placed endless chain drums, or pulleys. These endless chains drive pulleys or drums on the wheel axles, and by change of drums variations of speed may be obtained. The seat of the driver may, if desired, be arranged so as to rock and also work levers of the same kind as the above. Steering wheels are provided, “with shafts or a pole for horses, with a mast and sail or with a power engine, as may be desired.” A prop serves as a skid. Instead of rocking seats, a rocking floor may be used.

[*Printed, 4d. No Drawings.*]

A.D. 1863, July 10.—No. 1726.

HORNSBY, RICHARD, junior, BONNALL, JOHN, and ASTBURY, WILLIAM.—Traction engines.

This invention relates to various improvements in agricultural implements, including traction engines, which by the addition of a winding drum, may be used for hauling ploughs, &c. The traction engine has a horizontal boiler. “The cylinder or cylinders are placed in or near the bottom of the smoke box, or underneath the boiler. The pistons are fitted with trunks, so that the connecting rods may be jointed to them, as is usual in trunk engines, or other engines may be employed. The connecting rods give motion to a crank axis mounted underneath the boiler, and having a fly wheel at its end. This axis also carries a pinion, which gears with and drives a tooth wheel on another axis parallel with first, and also under the boiler. On the second axis is a chain pinion, which by a pitch chain drives a chain wheel on the axis of the hinder road wheels of the engine, which thus receive motion. In order to carry the weight of the engine, rods descend from the bearings of the axle, and at their lower ends are connected with springs, which rest on brackets fixed to the boiler and framing. The springs” preferred “are helical, and they are so applied as to be able

“ to accommodate themselves to the varying positions of the axle, and its bearings.”

The driving chain is constructed by preference in the following manner:—“ It consists of links or pieces of three different forms ; first, there are circular or ring links, which are short cylinders of metal bored or rendered true internally ; second, there are segment pieces, which are turned or formed on their curved face to the same diameter as the interior of the ring links. These segments are something less than half of the cylinder, and at each of their ends a short stud is formed ; third, there are connecting links consisting of short bars, with an eye at each end to fit the studs of the segment pieces. In making up the chain two segment pieces are placed in each ring link, and each of these segment pieces, by means of two connecting links, one on each side, is connected with one of the segment pieces in the next ring link. The connecting links are fitted on to the studs of the segments and the studs are kept in position by projections or gibb pieces at the end of the links ; the stud ends of the segments are afterwards rivetted over to keep them in their places. In this manner the chain is made up. The segment pieces and connecting links, when fitted together, work as if they formed one piece, but the segment pieces are free to turn within the ring links, and do so turn as the chain passes around the chain wheels.”

[*Printed, 4s. 4d. Drawings.*]

A.D. 1863, July 23.—No. 1841.

HOLDEN, ANDREW TAYLOR.—(*Provisional protection only.*)—Springs. This invention is described in its application to elliptical springs, but it is said to be useful in cases of springs of other kind. It “ consists in making the hinge joint of elliptical springs in the following manner:—The ends of both the inner or back plates to be connected together are rolled into a tubular form ; portions are cut away from the middle of one of the tubular ends, and from the sides of the other tubular end, so as to permit of the insertion of the last described end into the cut away portion of the former. The two ends are connected by a cylindrical core passed

“ through their tubular portions, upon which core the said  
“ tubular portions move when the spring changes its figure.  
“ The said core is made by preference of gun metal. In the  
“ axis of the core is a hole through which a screw bolt passes,  
“ by screwing a nut on which the parts of the joint are held  
“ together.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, July 30.—No. 1891.

APPS, THOMAS.—“ Improvements in four-wheeled vehicles.”  
The inventor says, “ I dispense with the usual driving seat and  
“ boot in the front of the body of the carriage, and dispose in  
“ that situation a small platform with a dashboard or iron in  
“ front. This platform I utilize in the carrying of luggage,  
“ and it may be further furnished with a hinged or otherwise  
“ moveable seat, on which outside passengers may be carried  
“ when not occupied by luggage. The driver’s seat I  
“ mount at the back part of the body; and may be fixed  
“ thereto, and further supported and stayed from the springs  
“ or otherwise. The driving seat is mounted at a sufficient  
“ elevation, so that the driver can see properly over the  
“ carriage, which being entirely in front of him is easy to  
“ guide, and is thoroughly under his control, as also the  
“ horse. The top of the cab may also be adapted to receive  
“ luggage, the reins being carried over a guide if necessary.  
“ In carriages of this construction the view of the passengers  
“ in the interior is not obstructed by the driver, as is usually  
“ the case, and the luggage being in front a passenger will  
“ be able to see that none of it is lost or stolen, as is often the  
“ case in street cabs. The dash-iron may be made moveable  
“ if necessary for the better accommodation of luggage. For  
“ gentlemen’s carriages the front platform before mentioned  
“ may be fitted up permanently for outside sitters, which  
“ may give it a better appearance than when intended for  
“ luggage principally. The axle of the fore wheels and the  
“ locking plates come under the platform, in manner similar  
“ to the position occupied by those parts under the driving  
“ seat, boot, and footboard of ordinary carriages.”

[*Printed, 6d. Drawing.*]

A.D. 1863, August 4.—No. 1919.

ABRAHAM, JOSEPH.—“Improvements in brakes for railway and other carriages.”

This invention relates to giving motion to a brake or brakes by means of a shaft for rotating or turning the brake apparatus, and also to means of “communicating the forward or backward motion for one brake to the next adjoining brake apparatus or several thereof.”

To the under side of each carriage are fixed bearers blocks or other supports for apparatus suitable for giving motion to the shaft arms, or levers for operating the brake or brakes, and to or within one of such supports is connected or mounted a box nut “which is free to turn or rotate but is prevented from moving longitudinally.” Within another of such supports works a shaft having a coarse pitched screw at one end and at the other a forked or hollow extension and a disc or plate having through it a square or other suitably shaped hole through which a correspondingly shaped bar is passed, these arrangements serving to couple the shaft of one carriage with that of another, and being capable of variation according to particular circumstances; gearing, universal joints, and other apparatus being employed as may seem most desirable, or screws being in some cases used.

The whole invention is described at some length, the details thereof being capable of variation. The patentee claims in particular the employment of two rods or bars for working the brake blocks of one pair of wheels “both rods being free to revolve whilst one has also a longitudinal motion communicated to it by means of a rotary motion” combined with screws, the friction brake block “being actuated by the longitudinal motion or traversing of one of the rods or bars.” Also the employment of a series of articulated bars taking into, or screwing one into the other, whilst the outer ends are so formed as readily to couple to the next rod, or to the rod projecting from and belonging to the next adjoining carriage, either by the means described “or any other which may be found equally well or better suited to the purpose.”

[Printed, 10d. Drawing.]



A.D. 1863, August 5.—No. 1933.

HODSON, WILLIAM.—Propelling carriages, &c. “This invention has for its object improvements in machinery used for propelling carriages and vessels. In the centre of the carriage frame is fixed an elevated cross bar which stands on two brackets, one on each side of the carriage frame. On the cross bar are fixed two or more swing bars which hang in a perpendicular direction, and work backwards and forward with the feet like the motion of a pendulum. At the bottom of the swing bar are fixed patterns or bearings for the feet to rest on. From the pendulum are attached connecting rods, which connecting rods are attached to the cranks fixed on the propelling wheels and also to the hand levers. The hand levers are connected to the swing bars, and all work in one motion. The steering apparatus is worked from the front wheels which goes to the man’s hands and body, thus allowing him to use both hands and feet in the propulsion when required.”

[*Printed, 6d. Drawing.*]

A.D. 1863, August 14.—No. 2009.

WILMOT, SAMUEL RUSSEL.—(*A communication from Alexander Douglas.*)—Locking wheels of hand trucks. This specification describes a hand truck, such as railway porters use, fitted with an arrangement for locking the wheels. This apparatus consists of a transverse bar sliding in attachments to the frame. When pressed down by the foot its ends engage with cogs attached to the wheels and so prevent rotation of the latter. When not in use a spring relieves the wheels and holds back the bar.

[*Printed, 8d. Drawing.*]

A.D. 1863, August 14.—No. 2018.

ASBURY, WILLIAM.—Axles and axleboxes. The nature of this invention is as follows:—“Firstly, upon the arm of the axle is formed a collar, at the back of which collar or upon the inside of the arm is placed a leather washer, and again behind this washer another washer or ring of cast or wrought iron, having grooves cut in its periphery; this ring may be formed either in one annular piece or in two semi-

“ annular pieces. In the box are cut slots to correspond with  
 “ the grooves in the ring before named; these are to receive  
 “ split cotters or set pins, which when the axle is put together  
 “ pass through the slots in the box and the grooves in the  
 “ ring, and thus bind all the parts together, leaving the box  
 “ free to rotate upon the axle.

“ Secondly, upon the outside end of the box is formed a  
 “ male screw, and upon the inside of the nave of the wheel a  
 “ female screw, making them right and left handed; thus  
 “ these two parts are screwed together, avoiding the use of  
 “ long and short bolts, front and back plates, and large leather  
 “ washer.

“ Thirdly, these improvements refer to the cap and a  
 “ method of lubricating the axle by means of an orifice in the  
 “ centre of the cap, this opens into an enlarged chamber  
 “ within the cap, in which chamber is fixed a conical tube the  
 “ smaller end of which enters the orifice in the cap; the oil  
 “ is poured into the chamber through this conical tube or  
 “ funnel, which by its form prevents any escape of oil, re-  
 “ taining it in the before-mentioned chamber.”

[*Printed, 10d. Drawing.*]

A.D. 1863, August 26.—No. 2104.

HOPKINS, THOMAS, junior.—Carriage door handles. These  
 improvements “ relate to the inner crank or lever handles of  
 “ broughams and other carriages, and consist in sinking the  
 “ nut, securing the inside lever handle to the spindle within  
 “ a recess made in the boss of said handle, and then conceal-  
 “ ing the whole with a button or knob of any suitable orna-  
 “ mental character. Instead of the screw of the spindle  
 “ projecting right through the boss and being secured by a  
 “ nut on the outside as usual, the button, ornament, or cover  
 “ turns on a pin mounted excentrically to the opening in the  
 “ boss, so that by simply pushing the button on one side the  
 “ aperture may be disclosed for unscrewing the nut when it  
 “ is required to remove the handle from the door. In fixing  
 “ the inner or lever handle to the carriage spindle in the first  
 “ instance it is readily effected and the nut hidden from view,  
 “ which is at the same time easily removable if required as  
 “ before described.”

[*Printed, 6d. Drawing.*]

A.D. 1863, August 27.—No. 2117.

CLARK, JOHN.—Brakes for railway and other carriages. This invention relates to improvements on No. 2821, A.D. 1862. "These new improvements consist, first, of compound levers and draw rods, which give greater range to the blocks, and are so fitted and connected therewith as to cause the breaks to be released by the gravitating power of the actuating mechanism when the break power is taken off," springs for that purpose being dispensed with.

Different modifications of the invention are described. In one case pairs of long levers are mounted so as nearly to meet towards the centre of the carriage, where their free ends are connected so as to slide and be supported in a link, the other ends of the levers being centred towards the ends of the carriage frames, from which centres they radiate, their free ends, which are raised by a running chain, being connected with the blocks by draw rods, such blocks being placed beyond the wheels at each end of the carriage and operating by being drawn against the wheels. In another case weighted levers are used, and in another case the ends of the draw rods are attached to levers so arranged that on the tightening of the running chain the rods and levers tend to form a right line and so actuate the blocks. In other cases, the blocks are so hung between the wheels as to rise and fall; various other arrangements such as friction wheels, drums, struts, cranks, levers, chains, and other mechanism, being described in profusion, and the brake blocks being composed either of wood or of other material, but in the former case having "saw cuts" therein to lessen the vibration and improve their action." Disc wheels are also in some cases placed loose upon the carriage axles, and forced into contact, when necessary with face plates or rings on the insides of the carriage wheels, the running chains being wound thereon. In other arrangements this "chain power" is made the means of depressing skids into contact with the rails.

A "compensation spring break for common road carriages" is described, in which the driver or conductor of the vehicle depresses a treadle or handle, and so brings into gear certain toothed wheels, which then wind up a powerful helical spring which acts as a brake to the motion of the carriage, this

spring, when the wheels are thrown out of gear upon the stoppage of the carriage, assisting, by its effort to unwind, in again starting such carriage."

[*Printed, 10d. Drawing.*]

A.D. 1863, August 31.—No. 2155.

ROBERTS, MARTYN JOHN.—(*Provisional protection only.*)—Axles. The inventor says, "my invention consists in a method of permitting each wheel and its axle of the carriage freely to rotate independently of the other wheels and axles, while at the same time I support the axles in such a manner as to release them, as much as is thereby possible, from the injurious influence of the oscillations of the carriage body." To obtain this desirable end whilst using a separate axle for every wheel, the wheel being fixed to one end thereof, supporting that end in a manner well known, I support the other end of the axle by one or more of the other axles of the carriage, either by a frame, collar, or bearing, or by some other suitable contrivance."

[*Printed, 4d. No Drawings.*]

A.D. 1863, September 3.—No. 2177.

BAILLY, NICHOLAS.—(*Partly a communication from Charles Durand.*)—Axlebox. The patentee in setting forth this invention, mentions particularly "railways and their countless axletrees," and states that his invention "allows the journals or axles to revolve without being at all lubricated, the locomotion becomes much lighter, and the wearing out is almost null, for the bearing parts are no longer sliding, but rolling on each other."

An arrangement is described in which the axle of a railway carriage (for example) sustains its load through the medium of a sphere or ball, there being at each side of, but above, the centre of the axle, a hollowed or dished circular piece, provided with three balls, against which a "covering piece" works, these covering pieces having bevilled or slanting edges, in contact with which the axle works, certain plates, pivots, and other mechanism being employed to keep the parts in their places.

Different modifications of the invention are described

suitable for application to horizontal and also vertical shafts, as well as axles.

[*Printed, 8d. Drawing.*]

A.D. 1863, September 3.—No. 2179.

BONNEVILLE, HENRI ADRIEN.—(*A communication from Jean François Frederic Beguin.*)—Attaching horses to vehicles. Instead of the ordinary shafts or pole, there is for each horse a pair of curved iron bars fastened at one pair of ends to the futchells and meeting at the other ends and being secured in a loop or fastening on the saddle, on the horses back. When two horses are used a splinter bar is employed as a means of connecting the curved bars and the vehicle. This splinter bar has a tongue piece capable of adjustment, so as to adapt the bar to varying heights of horses, which fits into the usual pole socket.

[*Printed, 8d. Drawing.*]

A.D. 1863, September 5.—No. 2193.

SMITH, THOMAS.—(*Provisional protection only.*)—Brake for waggons. This relates simply to the substitution of a wheel handle for the ordinary bar handle commonly used in waggons “at the Cape of Good Hope and other places.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, September 11.—No. 2242.

DOBBIE, JAMES.—“Improvements in the construction of “railway and other carriages.”

As applied to railway carriages this invention consists in constructing the framework of the upper part or body of the carriage “of hollow frames or ribs of iron or other metal” and of “trough-shaped section.” “The frames are made of “any required shape or form desired to be given to the “carriage,” each frame consisting of one piece, or of more pieces than one joined together by bolting, rivetting, or welding, “making one whole and complete frame or rib,” such frames or ribs being “placed transversely or at right angles “to the length of the carriage, and rivetted, bolted, or other- “wise fastened to the longitudinal side beams of the under “carriage or truck.”

Various modes of carrying out the details of the invention are described, the patentee claiming particularly, in addition to constructing the framework of the upper part or body of railway and other carriages of hollow frames or ribs, as mentioned above; constructing the framework of the under carriage wholly of iron beams; arranging sheet iron or other sheet metal between the trough-shaped frame or ribs; and the employment of **Z**, **T**, **7**, or **3** iron beams for the framework of such under carriage. A wooden lining is in some cases placed within the iron framework.

[*Printed, 1s. Drawings.*]

A.D. 1863, September 14.—No. 2257.

MILLIN, GEORGE FRANCIS.—(*Provisional protection only.*)—Detaching horses and applying brakes. The following is the inventor's provisional specification:—"The object of this  
 " invention is to provide that in cases of danger from horses  
 " taking fright the driver may be enabled, by merely lifting  
 " a lever, to thereby detach the horses or draught animals  
 " and also put a break on a wheel or wheels of the vehicle.  
 " This I propose to effect either by having a strong steel bolt  
 " securing the pole or shaft in a socket and passing through  
 " rings at the ends of the outside traces, this bolt being  
 " drawn up a few inches by a lever lifted by the coachman or  
 " driver so as to allow the shaft to be drawn from the socket,  
 " and at the same time loose the outside traces, thus detach-  
 " ing the horses. The break may be a sliding piece of tough  
 " iron which passes under a projection on the inner side of  
 " the rim of the wheel thereby totally stopping the wheel,  
 " or it might, if requisite be applied to both wheels; or I use  
 " for detaching the horses what I find in many respects more  
 " preferable, viz., a blocks liding in a groove and secured to the  
 " piece connecting the two shafts by a screw underneath or at  
 " the sides. The shafts might thus be taken off on ordinary  
 " occasions, there being a block as on the other side, but  
 " screwed up to the shaft, also a strong spring coil which  
 " would contract on the removal from its socket of the steel  
 " bolt first above mentioned, thereby withdrawing by lever  
 " gearing horizontal bolts from the shafts, which would thus  
 " be detached. This modification is well suited to one horse

“ carriages, where two shafts are used. But by substituting  
“ the outside traces for the shafts and having the pole fixed  
“ in the middle, to be secured by the bolt in the socket, as in  
“ the first mentioned arrangement this modification may be  
“ used for a pair horse carriage. The break-power arrange-  
“ ment may be put on and taken off by the same lever arrange-  
“ ments as are used to release the pole. Or instead of having  
“ one handle to detach the horses and apply the break I have  
“ two handles, one for each purpose ; also instead of having  
“ a projection on the rim of the wheel, a hollow in the same  
“ may be made to receive a bolt and completely lock the  
“ wheel.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, September 18.—No. 2297.

COOK, JOHN MASON. — Preventing vibration in carriages. The objects of this invention are “to prevent noise, and to  
“ diminish the oscillation of railway carriages and other  
“ spring vehicles” and the invention consists in the introduction of vulcanized india-rubber, or any other substance which will act as a non-conductor of sound, between the wheels or springs and the body of the vehicle.

A mode of applying the invention to a railway carriage is described, in which a layer of vulcanized india-rubber, vulcanite, or any other substance which will act as a non-conductor of sound is placed between the floor and the upper part of the framing of the carriage, layers of the same material being placed between the axle guards and the framing, as well as between the latter and the braces or straps by which it is connected to the inner ends of the springs. Such layers may be placed, in fact, between all the parts which serve to connect the springs, axles, and wheels to the framing or body of a vehicle; the holes in such layers, which are made for the purpose of receiving the pins or screws by which they are secured in their places, being made of somewhat less diameter than such pins or screws in order that the latter may fit therein tightly, washers of the same material as the layers being also placed under the heads of the pins or screws, and in other places where requisite.

[*Printed, 6d. Drawing.*]

A.D. 1863, September 21.—No. 2320.

ELSDON, WILLIAM.—“ An invention for the construction of  
“ rail and road carriages and improved wheel tyres, and an  
“ improvement in railway crossings adapting them to such  
“ carriages.”

The object of this invention is to enable goods to be conveyed along a railway, a street, a road, “ in the same carriage  
“ without being unloaded,” as likewise to enable passengers to be conveyed along such railway, street, or road, without changing their seats.

The wheels of the carriages are furnished with tires each of which is provided with two running surfaces of different diameters, the larger of these forming the running surface of the wheel when the latter is worked upon a street or ordinary road, while the smaller portion forms the bearing surface of the wheel when working upon a rail the larger portion of the wheel then serving as a flange to keep the wheel upon the rail. These working surfaces may be so shaped on their exterior as best to suit the formation of the street, or road and rails on which they are to work; and the tires may be formed of either iron or steel, or both, and rolled and otherwise treated by ordinary means.

Another part of the invention consists in so arranging the frames of the fore wheels of the carriages as to be moveable when the carriage is running upon a street or ordinary road but capable of being locked when travelling upon rails. The frame of the fore wheels of each carriage is connected thereto by means of a central bolt or pivot, on which it is capable of turning when unlocked, but it is locked when necessary by the insertion of other bolts or by any other suitable means. Such frame may be composed either of wood or other suitable material and the body of the carriage of iron or steel or other substance. The carriage may be of any shape and size adapted to the purpose for which it is intended and may be provided with shafts for use when being drawn along a street or road. And the wheels may either be loose upon the axles or fixed thereto, and the carriage be provided with springs or otherwise as thought best.

The rest of the invention relates solely to the construction of



rails, with their crossings and other adjuncts, and does not require particular notice here.

[*Printed, 10d. Drawing.*]

A.D. 1863, September 28.—No. 2376.

LOWE, THOMAS.—“An improved break for railway and other carriages.”

The patentee says, “my invention consists in fitting to or forming as part of the axles of railway engines, carriages, and trucks (at the centre or other suitable part), a collar or wheel having teeth on one portion of its periphery, the other portion being recessed to receive a break band or strap, which forms the break power as hereafter stated. On spindles slightly inclined and kept clear of the collar or wheel during the progress of the train I mount two pinions; the upper ends of these spindles carry toothed wheels which gear into a central wheel, the axis of this central wheel being arranged to conduct and receive a threaded shaft placed vertically. The lower end of the vertical shaft is jointed to one end of a lever in connection with a break band or strap. In connection with the above arrangements I employ a triangular or three legged lever, two of its legs being connected loosely to the lower ends of the before-mentioned spindles, the other leg having two wires or chains attached thereto, which chains pass over pulleys, one to the guard, and the other to the driver. The leg last mentioned has a bolt in the back, which takes into holes or slots in a quadrant shaped bar, for the purpose of retaining the leg in any desired position. The guard and driver have each under their control a spring bolt lever working in a notched quadrant; to these levers the other ends of the wires are connected. A bell is placed on each of these quadrants, which is sounded on either wire being pulled. Near the upper ends of the spindles two rods are jointed, their inner ends being connected to slide nuts for the purpose of working down the vertical screw shaft. Springs are employed to assist in returning the apparatus to its normal position. The apparatus is fitted under the engine, carriage, or truck and is enclosed in a suitable casing.

“The action is as follows:—Upon the guard pulling the lever in his compartment, the wire is caused to draw the

“ upper leg of the triangular lever to one side of the apparatus  
 “ whereby the bolt is released, at the same time one of the  
 “ lower legs with the pinion is made to approach the toothed  
 “ collar on the axle, into the teeth of which it engages,  
 “ the rotation of the axle and collar cause the pinion and  
 “ spindle to revolve with the toothed wheel at its upper end,  
 “ and also the central wheel, whereby the vertical threaded  
 “ shaft is lowered, and the break band or strap is applied.  
 “ When the wire in the guard’s compartment is acted on, the  
 “ bell near the driver is sounded, thereby giving him notice  
 “ to release his spring bolt lever. The same operations are  
 “ performed by the driver when he wishes to apply the brakes.  
 “ Electricity may be substituted for bell arrangements for  
 “ indicating the application of the breaks.”

[Printed, 10d. Drawing.]

A.D. 1863, October 1.—No. 2403.

BONNEVILLE, HENRI ADRIEN. — (*A communication from Isidore Alexandre Moineau.*)—(*Provisional protection only.*)

This invention consists in the employment in combination  
 with the ordinary mechanism, “ of pulleys or polyspasts, and  
 “ principally the differential pulley or pulley with variable  
 “ diameters, for increasing the force and pressure of the  
 “ break on the wheels of railway and other carriages.”

A mode of applying the invention is described, in which a  
 differential pulley is mounted upon an axis placed in suitable  
 “ supports below the tender of a railway train an endless  
 “ chain passing into the grooves of this pulley, and also  
 “ partially round an ordinary pulley, to the axis of which is  
 “ connected a hook which receives the first link of a chain  
 “ passing longitudinally under the tender, and having con-  
 “ nected to it about midway the upper end of a lever con-  
 “ nected with break arrangements of the ordinary character.  
 “ By turning the differential pulley in one direction the  
 “ breaks are pressed against the wheels, while on turning it  
 “ in the other direction they are released therefrom, the  
 “ turning of the pulley being produced by means of a winch  
 and suitable gearing. The “ floating or loose part ” of the  
 endless chain passes round a “ centre pulley ” by which it is  
 supported and the longitudinal chain beneath the tender is

apparently meant to be connected with other chains passing below the carriages of a train so as to actuate the whole of the brakes of the train simultaneously.

[*Printed, 8d. Drawing.*]

A.D. 1863, October 12.—No. 2499.

GIDLOW, THOMAS.—(*Provisional protection only.*)—Bearings for axles. “The improved bearing consists in an outer case  
“ or means of enclosure, at each side of which is applied a  
“ metallic bar or support which carries or supports a fixed  
“ shaft, upon which rotates a roller of large diameter, and  
“ about the width of the bearing surface of the axle. The  
“ exterior case is open at the lower part to admit the axle, and  
“ is furnished with side pieces to retain the axle directly  
“ under the vertical centre of the roller which is in contact  
“ with the axle and forms its bearing. By means of this arrange-  
“ ment, and the diameter of the roller being about twice the  
“ diameter of the axle, a bearing is obtained by which the  
“ friction is considerably diminished which is especially  
“ evident when the wheels are passing round curves.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, October 13.—No. 2510.

ROLFE, ALFRED.—(*Provisional protection only.*)—Propelling vehicles. The inventor arranges “on a carriage suitably  
“ constructed for the purpose a wheel or wheels of proper  
“ size, which are mounted on bearings, by preference, having  
“ the least amount of friction possible, and are actuated (by  
“ preference) by men working the handles or cranks attached  
“ to these wheels (though steam or air engines, or other means  
“ may be employed for this purpose). These fly wheels are  
“ connected by means of endless bands or straps with a series  
“ of one or more wheels suitably mounted on the framing  
“ carrying the fly wheel or wheels, and are finally connected  
“ (by means of fast and loose pulleys on the axle) with the  
“ wheels running on the road, and to which the power is  
“ thereby imparted.

“In working the apparatus, when the time arrives for  
“ stopping the train or carriages, the strap connected with  
“ the driving wheel is shifted on to a loose pulley from the

“ pulley which actuates these wheels, and when there, instead  
 “ of the men or other power working the levers stopping the  
 “ fly wheel, they continue it at work, and the power so  
 “ obtained is accumulated by the fly wheel until required  
 “ when starting the train, when on the strap being shifted  
 “ to the fast pulley, the carriage will be at once propelled  
 “ forward. When required to stop the carriage or carriages,  
 “ breaks are applied in the ordinary manner, or they may  
 “ be so adapted as to cause the power wasted in the act of  
 “ ‘ breaking ’ to be transmitted by suitable gearing to the fly  
 “ wheel or wheels. When required to reverse the carriage  
 “ the fly wheels may be stopped and reversed by working  
 “ them backwards, or the fly wheels may be continued in  
 “ the same direction, and the motion may be reversed by  
 “ having crossed straps working on fast and loose pulleys, so  
 “ that the pulleys work different ways on the straps being  
 “ shifted, as is well understood.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, October 13.—No. 2514.

CRELLIN, ALEXANDER.—(*Provisional protection only.*)—Indicator for public vehicles. For the purpose of actuating the registering gear the steps are made moveable. When a passenger ascends into the vehicle he depresses the first step. This throws the machinery into gear. The second step either thrusts forth a ticket or registers one on the indicator. The third step restores the apparatus. Similarly in descending another indicator is caused to register the passenger. When different fares are chargeable, the apparatus is caused to provide a fresh series of tickets at the commencement of each stage or division. The middle step when depressed [causes a ticket to be presented to the passenger, who, when he descends, drops it into a box.

[*Printed, 4d. No Drawings.*]

A.D. 1863, October 19.—No. 2557.

EYNARD, LOUIS.—(*Provisional protection only.*)—Brakes. The following is the inventor's provisional specification:—“ My  
 “ invention consists in adapting to and applying underneath  
 “ each carriage of a railway train, a frame carrying a skid or

“ break for each wheel, combined with a spring fixed on each side of the carriage, such springs being compressed by the frame in order to remove the breaks from the wheels, and having a tendency to react on the frame and thereby force the skids or breaks on to the wheels when liberated from the pressure of the frame.

“ The mode of raising the frame so as to compress the springs is by means of a central shaft or axis suitably mounted in the lower part of the carriage, by turning which shaft a cord or chain (passing over guide pulleys) is wound on to the same, the two ends of such cord or chain being connected to the frame. And the frame is kept raised as required by means of a ratchet wheel on one end of the said shaft retained by a pall acted upon by a spring. But the frame may be raised as required by means of other suitable mechanism.

“ The pall or other retaining mechanism is withdrawn as required by means of a rod extending the whole length of the carriage, which rod is caused to act on a cord or chain or other means of connection with the said pall or retaining mechanism. And the several rods of the several carriages are flexibly connected at their ends so as to admit of their being simultaneously acted upon when required by the guard at the end of the train.

“ My improvements in breaks, as herein set forth, are also applicable to detached carriages, as also to common road or other vehicles.”

*[Printed, 4d. No Drawings.]*

A.D. 1863, October 20.—No. 2573.

NOTTINGHAM, JOHN WILLIAM.—‘Hansom’ cabs and other vehicles. “ The head of the cab, instead of being a fixture or folding back like that of a barouche, is constructed in a rigid form on a frame of iron or otherwise, and is so arranged as to be capable of being turned over, so as to enclose the back of the cab, turning bodily upon pivots placed in front thereof. The window or blind is formed of laths, either glazed or otherwise and hinged together, so as to be perfectly flexible, the ends of the laths running in grooves formed in the side of the head, and extending round the curved top of the same, so that the window or

“ blind can either be pulled partly or wholly down or raised up  
“ by the occupant, the window or blind when entirely raised  
“ lying under the curved roof. Instead of placing the springs  
“ as in ordinary cabs, outside the body of the vehicle and  
“ between it and the wheels, they are placed beneath the  
“ body, and by these means a much wider body than  
“ ordinarily can be made without increasing the width apart  
“ of the wheels. The driver's seat, instead of being a fixture  
“ as ordinarily the case, may be so arranged that it can be  
“ removed altogether when it is desirable that the occupant  
“ of the cab should himself drive. In this case an arrange-  
“ ment is made so that the servant can stand behind the cab  
“ on the part whence the seat has been removed. The doors  
“ of the cab are made to open nearly the full width of the  
“ vehicle and to fold or slide sideways in front of the wheels,  
“ so as to afford greater space for entering and leaving such  
“ vehicles, and also to prevent the liability of soiling the  
“ dress in entering or leaving the same. The shafts of the  
“ cab may be made entire as in ordinary cabs, or made  
“ (either of metal or wood) with the fore part detachable by  
“ means of a socket or otherwise, so that in the event of a  
“ shaft breaking a fresh part can be readily substituted.”

“ It will be evident that parts of this invention (and more  
“ particularly the first and second parts) are equally appli-  
“ cable to other wheeled vehicles drawn by horses or other  
“ animals, or to perambulators.”

[*Printed, 1s. Drawings.*]

A.D. 1863, October 21.—No. 2579.

CLARKSON, THOMAS CHARLES.—Material for parts of carriages and other purposes. This invention relates to certain materials used by the patentee for harness, accoutrements and other purposes. These materials are of different kinds, such as unions of cork and woven fabric cemented together; woven woody fibre coated with india-rubber or gutta-percha or cloth. The latter is said to be useful for covering carriages and parts thereof.

[*Printed, 1s. Drawings.*]

A.D. 1863, October 23.—No. 2619.

TOLHAUSEN, FREDERICK.—(*A communication from Georges Badaul.*)—(*Provisional protection only.*)—Adjusting and regulating springs. The object of this invention is to regulate the action of springs in relation to each other, so as to prevent shaking or oscillation of the carriage.

“The mode of carrying this invention into effect is by placing two bars forming a cross section between the two springs. At end of each bar pulleys or castors are placed, which rest and work in recesses in the axle or in the cross bar uniting the two springs in the present devices. The two bars aforesaid are not rigidly united, but are free to move like the arms of a pair of scissors, so as to allow their opening more or less, the castors above mentioned allowing this variation to take place. Thus it will be understood that by the use of these yielding crossed bars, whatever pressure is exerted on one spring the same is exerted on its fellow in such manner as to obviate to a great extent the rolling or side motion.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, October 26.—No. 2638.

BARKER, FREDERICK.—“Improvements in carriages.”

These improvements consist, firstly, in attaching the shafts or splinter bar of four-wheeled carriages to the body part of such vehicle by means of a drawing bar so arranged as to convey the draught direct to the body, and yet to admit of the shafts or splinter bar moving laterally or in a curved direction, so as to produce what is technically called the locking action, instead of attaching them to what is technically called the fore-carriage or locking part of the underworks.

“Secondly, in constructing four-wheeled carriages with two or more pivots or turning centres, being specially for the shafts or splinter bar to move round when turning instead of constructing them so that the shafts or splinter bar move round one and the same centre with the fore-carriage and wheels as at present.

“Thirdly, in placing the coachman’s seat, together with the locking or moveable part of the underworks of four wheeled

“ carriages, at the back of such vehicle instead of the front thereof as hitherto.

“ Fourthly, by connecting the hind axle of four-wheeled carriages to the shafts or splinter bar thereof by means of steering rods or other connections so arranged that when the horse deviates from a straight course the hind wheels deviate in an opposite direction.

“ Fifthly, in a novel construction of body for a carriage to be called the Alexandra car, with four seats so arranged as to be at right angles, or nearly so, with each other, and all facing to one centre, with the doors on each side of the hind seat, so that when the carriage is facing towards the west one seat would be facing the east, one towards the north, one towards the south, and one to the west, the doors being on each side of the latter named seat.

“ Sixthly, in an arrangement of the windows of such carriages as have fronts of a segmental form, whereby such windows are divided into three squares of glass of about equal size, the centre one being fixed and the two side ones sliding horizontally in an inner groove, and so arranged that when one of them is moved to the centre it may be displaced from its own groove and placed in a recess at the back of the centre glass, thus leaving room for the other side glass to be moved in its own groove to the back of the other two, so that the three glasses occupy only the width of one, thus leaving two-thirds of the space open instead of half as afforded by the usual plan.

“ Seventhly, in attaching the shafts of a Stanhope chaise to the fore and hind ends of the side springs, the hind end of the shaft being made to play through a socket as the spring lengthens in motion instead of resting the shafts on the axle by means of bearing irons.

“ Eighthly, in the employment of the form of a corrugated shell, stamped or moulded in papier mache, metal, or any other suitable material, to form either the side or back of a carriage seat, such seat being applicable to any description of wheeled carriage.

“ Ninthly, in the employment of springs in the form of one or more complete rings or loops, or a compound of complete rings or loops, such rings or loops being placed in a perpendicular position, and being formed by bending one



“ or more bars of steel or any other suitable material in such  
 “ a manner that the ends thereof touch or overlap each  
 “ other.”

[*Printed, 2s. 6d. Drawings.*]

A.D. 1863, November 10.—No. 2793.

CASTELNAU, FRANÇOIS.—(*Provisional protection only.*)—Two wheeled vehicles. “ This invention consists of certain improvements in the construction of vehicles or carriages having two wheels, the objects being, firstly, to maintain the level or horizontal position of the body of the vehicle whatever may be the height of the horse; and secondly, to prevent the body of the cart from being thrown forward in the event of the horse falling.” The inventor proposes to accomplish the first purpose by connecting the shafts by hinges or pins to the sides of the vehicle at the centres thereof, and by a hand screw passing through the front portion or frame of the body of the cart, and through a cross bar joining the shafts, by which means the level of the cart may be regulated by turning the screw in the requisite direction. Should the horse fall down the screw may be turned so as to elevate the front of the body and throw the weight more to the rear, in order to relieve the front of the shafts from a great portion of the weight.

“ The shafts when under the frame of the cart may be connected to the central position of the body by means of standards supported and strengthened by tie rods; or the body of the cart may rest on the springs, and the shafts may be attached underneath the body by curving their rear ends upwards, or they may be attached to the sides of the frame of the cart by straight shafts and hinges or pins.

“ The second part of the invention consists in attaching to the under fore part of the cart or cross bar two vertical rods descending towards the ground; these rods are furnished with bearings at their lower part containing small wheels which are held a few inches from the ground, but when the horse falls the shafts are allowed to drop down by means of slides in the rods, to which slides the shafts are fixed or hinged, and the bearings of the small wheels being held in the slides it will follow that the wheels will be brought

“ in contact with the ground, and so support the fore part of  
“ the cart.

“ The invention may be applied to hand carts or trucks, or  
“ other varieties of carriages running on two wheels.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, November 11.—No. 2798.

TESTUZ, FRANÇOIS.—(*Letters Patent void for want of Final Specification.*)—Brakes for railway and other carriages. “ The  
“ blocks of wood are fixed in pairs upon beams or bars reach-  
“ ing from one wheel to the other, and these beams or bars  
“ are hinged to and suspended from the frame of the carriage,  
“ one in front and one at the back of each pair of wheels to  
“ which the break is to be applied. As close to the inner  
“ side of each wheel as may be convenient, a bracket is fixed  
“ to the frame of the carriage fitted with a pin or stud reach-  
“ ing too near the axle. These pins serve as fulcrum to two  
“ levers, the short ends of which may be connected by two  
“ tie rods with the break beam at the back of the pair of  
“ wheels, whilst two similar tie rods connected with the beam  
“ in front of the wheels are hinged to the lever arms on the  
“ opposite sides of but at equal distances from the fulcrum. The  
“ long arms of these two levers extend to or near the middle  
“ of the axle or beyond it, and their ends are connected by  
“ means of links or otherwise with a rod or bar, to which a  
“ backward or forward motion can be given by any suitable  
“ mechanism, such as is already known and employed for  
“ actuating breaks. It is evident that by moving the said  
“ rod or bar backward or forward the break beams with  
“ breaks will advance towards or recede from the wheels. The  
“ bars or rods acting upon the levers as described (or chains  
“ or ropes used in place of such bars or rods) of several or of  
“ all the carriages forming a railway train may be connected  
“ together and worked simultaneously from any one carriage  
“ fitted with the necessary mechanism or apparatus for  
“ working the breaks. In cases where the axle does not  
“ revolve with the wheels the pins, studs, bosses, or bushes  
“ acting as fulcrum may be fixed direct upon the axle. The  
“ said fulcrum may also be placed horizontally, in which case  
“ the levers will move vertically. Instead of moving the  
“ break beam backward and forward as described, the said

“ beams may be so hung or suspended or fitted with springs  
“ as to cause them to recede from the wheels of their own  
“ accord when liberated.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, November 19.—No. 2907.

CHRISTMAS, ELEAZAR.—Bottom side plates. The invention is thus described by the inventor:—“My improvements consist in substituting for the bottom side plates, as at present constructed, a bottom side and doorway plate, which across or opposite the doorway, between the standing and hinged pillars, is made wholly of metal. These improved bottom sides are formed of plates in the solid or in parts and rivetted or bolted together. I prefer making up the required depth of section by placing two or more plates one upon another and rivetting the same together, so as to form a truss by chain or common rivetting principles with the bottom boards supported upon, between, or under the said plates. By this improvement I obtain, with the same section of metal an increase in the strength or stiffness of the rib and flange, a result which I consider to be of great importance in this part of the bottom side frames of open carriages.

“Another improvement which the improved plan of constructing the bottom side plates, herein described enables me to effect, is greater width of level bottom for the feet, or a very shallow threshold is thereby obtained, the bottom of the carriage being either perfectly level the full width of the carriage between the door and door, or the threshold so much reduced in height that the top of the carriage mat will be level therewith.”

[*Printed, 8d. Drawing.*]

A.D. 1863, November 27.—No. 2989.

GASKELL, PETER.—Distance indicator. The patentee says  
“When the fare to be paid is to be according to the distance  
“travelled I transmit motion from one of the wheels of the cab  
“to a toothed wheel that can turn freely on an axis, but which  
“can be made fast with the axis by a friction clutch, the axis  
“passes through the centre of a dial plate, that forms the

“ front of a circular case, and on the outer end of the axis is  
“ a hand or pointer. At the commencement of each journey  
“ the axis is by the friction clutch made fast with the toothed  
“ wheel, the hand or pointer will then at the end of the  
“ journey indicate on the face of the dial plate the distance  
“ travelled and the amount of fare to be paid. At the end of  
“ each journey the friction clutch is moved so that the toothed  
“ wheel is loose upon the axis. The axis is then by means of  
“ a spring turned round so as to bring the hand or pointer  
“ upon it back to its starting point.

“ In order that the owner of a cab may know at the end of  
“ a day the fare chargeable for each journey made by the cab  
“ during the day, there is on the opposite end of the axis to  
“ that which carries the pointer, an arm, on which is a  
“ slide capable of moving lengthwise along the arm, this  
“ slide carries a small punch, which can be protruded out-  
“ wards from the slide, and which when so protruded out is  
“ caused to pierce a disc of paper that is held by means of  
“ small pins on the back of the case; this disc of paper is  
“ marked to correspond to the dial face, and each time that  
“ the pointer carried by the axis is allowed to turn back to  
“ its starting point the punch is caused first to punch a small  
“ hole in the paper disc. For this purpose I prefer that both  
“ the punch and the friction clutch, by which the toothed  
“ wheel is made fast to the axis, should have motion given to  
“ them by turning a handle having on its axis a cam that first  
“ acts to force out the punch to mark the disc of paper, and  
“ then acts on the lever that works the sliding friction  
“ clutch; by this means each time the pointer is moved back  
“ to zero the punch must previously have marked the disc of  
“ paper; the slide that carries the punch is after each time  
“ that the punch is caused to pierce the disc of paper moved  
“ a distance towards the axis along the arm that carries it so  
“ that the punch can never mark the paper disc twice in  
“ the same place. When the fare is to be reckoned by time,  
“ then in place of giving motion to the toothed wheel from  
“ one of the wheels of the cab, the toothed wheel has motion  
“ transmitted to it from clockwork.”

[*Printed, 10d. Drawing.*]

A.D. 1863, November 30.—No. 2994.

ETIENNE, ANDRÉ.—(*Provisional protection only.*)—Carriages and wheels. “This invention” says the inventor “consists  
“in certain improvements in the construction of carriages and  
“other vehicles and of wheels applicable thereto. In carry-  
“ing out the first part of my invention, I employ two springs  
“crossing each other at right angles and presenting four  
“points of support, on which I fix a frame of wood and  
“suspend the carriage body thereon by the intervention of  
“two small springs on the frame so as to create a double  
“suspension and to diminish the friction. Secondly I sup-  
“port carriages, omnibuses, and other vehicles on three  
“wheels as follows:—I place the two wheels on one axle  
“under the centre of the body in such manner that the  
“carriage body shall rest thereon almost in a state of  
“equilibrium or balance, so that the front wheel, which is  
“placed in a central line with regard to two wheels and in or  
“beyond the front of the carriage, shall bear no portion of  
“the weight, but simply serve to steady and guide the  
“vehicle. The improvement in the construction of the  
“wheels consists in making their circumference of a series  
“of three irregular curves; for example, if the circumference  
“of a circle be divided into six equal parts, and three of  
“those parts alternately be raised by irregular curvilinear  
“lines, it will follow that at three periods of each revolution  
“the wheel will acquire an impetus as it revolves from the  
“raised curves to the lesser circumference, whereby the  
“horses will be enabled to draw the carriage with very  
“increased facility. The spokes must be made of the neces-  
“sary varying lengths to suit the felloes and tyre. To  
“prevent the overturning of the carriage, I suspend the body  
“thereof at each end in a line with the centre and above the  
“centre of gravity by means of two pivots set in vertical  
“bars and in communication with the springs and wheels,  
“so that when the wheels rise over an impediment in  
“the road the level position of the carriage body is main-  
“tained, being aided by the weight of the passengers;  
“and in the event of the wheels overturning, the carriage  
“cannot be affected, since the pivots could have no power to  
“throw over the body, which would preserve its balance,

“ and, if necessary, springs may be attached to the bottom  
 “ of the carriage body to relieve any slight shock from its  
 “ settlement upon the ground. The splinter bar is made so as  
 “ to be released from the pole or shafts or the carriage frame  
 “ by means of hooks and rings under the control of the  
 “ coachman, who by releasing a spring, can disengage the  
 “ pole or shafts or the splinter bar, and leave the carriage to  
 “ come to a state of rest.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, December 5.—No. 3061.

WALTHER, FREDERICK JAMES.—(*Provisional protection only.*)  
 The following is this provisional specification:—“ This inven-  
 “ tion has for its object improvements in apparatus for  
 “ sustaining and lifting draught horses, to prevent them  
 “ falling or injuring the vehicle to which they are attached.  
 “ For this purpose I connect to the saddle of the harness, or  
 “ to other sufficiently strong belt or band passing round the  
 “ horse, a chain, cord, or strap proceeding to the top of the  
 “ vehicle, or to an arm fixed to the vehicle and above the  
 “ horse, so that should the horse stumble or fall he is at once  
 “ supported by the said chain, cord, or strap. I also connect  
 “ with the carriage or vehicle apparatus for hauling up the  
 “ said chain, cord, or strap, in order that should the horse  
 “ run away or otherwise endanger the safety of the carriage  
 “ or vehicle, he may by means of this apparatus be lifted off  
 “ his legs and rendered powerless. The same apparatus will  
 “ serve, when the vehicle is standing, to suspend the horse  
 “ for the purpose of resting him. In vehicles drawn by two  
 “ horses, I prefer, in order to support the horses, more  
 “ especially in slippery weather, to arrange between and over  
 “ them a pulley mounted on an arm projecting from the  
 “ vehicle, and I pass a chain, cord, or strap over this pulley,  
 “ the said chain, cord, or strap being secured at one end to  
 “ the saddle or belt passing round one horse, and at the other  
 “ end of the saddle or belt passing around the other horse, or  
 “ the pole or shafts of the vehicle may be employed for sup-  
 “ porting and lifting the horse or horses, the outer end of the  
 “ pole or shafts being forced upwards so as to support the  
 “ horse or horses or to lift it or them. By this arrangement

“ if one horse slips his weight is at once thrown on to the  
“ other horse, and he is supported sufficiently to allow him  
“ to recover his legs. The pulley and arm may be made  
“ stationary, or by a screw or otherwise it may be raised  
“ either so as to assist a horse that has slipped in recovering  
“ its legs, or to impede the horses in running away.”

[*Printed, 4d. No Drawings.*]

A.D. 1863, December 18.—No. 3195.

ADAMS, WILLIAM BRIDGES.—“ Improvements in locomotive  
“ engines and trains for railways, tramways, and common  
“ roads.”

This invention is described at some length and under various modifications, and consists in the first place, in constructing a locomotive engine with a “bending frame” and an arrangement for communicating motion from one wheel to another, “that is to say, by upper wheels connected by their “peripheries to lower wheels of unequal or equal diameters, “or vice versa;” or with a rigid frame, or a frame in two “parts bolted together; the object of the “bending frame” (which is in effect a frame formed in separate parts jointed together) being to facilitate the passage round curves in the rails. The “upper wheels” are wheels mounted so as to be in contact with some of the driving wheels of the engine, and also in contact with the other wheels of such engine, or with those of the tender, or of other vehicles. In one arrangement the driving wheels of the engine are without flanges, in order to reduce friction on the rails. Arrangements are also set forth in which such upper wheels are used to communicate motion to “radial wheels with radial axle boxes, or to separate “tenders or frames with radial bars,” “or to the wheels of “pivotted bogies or trucks, so that the connection may be as “complete on curved lines as on straight, the connecting “wheels being a substitute for side or connecting rods, “which are only adapted to parallel axles and straight lines.” This part of the invention also includes a construction of engine “with two or four or more coupled central wheels, “and with end wheels in radial axle boxes and a rigid frame, “which for convenience may be made in two parts to bolt “together.”

The patentee causes the “under frames or bogies at one or

“ both ends of an engine or carriage to traverse from side to side across the upper frame on curved lines, curved bars or slides being provided with or without rollers to facilitate the movement, and place the axles in a true position on curves.” In the radial or curvilinear axle boxes the box is made in two parts, “ the outer part being made to slide vertically on the horn plates or axle guards, and the inner portions to slide on curved lines horizontally within the outer box, either with rollers or sliding surfaces. When used for common roads the traction rod is made to guide the wheels into their curved courses.”

Secondly, the invention consists in the construction of carriages “ with radial end wheels and two or more central rigid or sliding wheels, in one solid frame, or on two frames bolted together, for convenience of transit when not on rails.”

Thirdly, in certain arrangements of engine and carriage brakes, “ which will follow the wheels whether on straight lines or curves.” A “ carrying bar ” is mounted upon a bearing in the centre of each axle, this bar carrying at its ends round bars which are parallel with the axle, and from which descend levers carrying the brake blocks, while other levers ascend from them with which are connected longitudinal rods, by moving which the brakes can be applied to and removed from the wheels at pleasure; steam power, or the action of friction wheels, being used to operate such rods, and the rod of one carriage being connected with that of another by suitable means.

The invention further includes a mode of constructing waggon without steel springs, the wheels revolving upon a fixed axle, and the latter being connected with pedestals which are bolted to the sole bar, a block of india-rubber being (if desirable) placed between the pedestal and the sole bar, and the frame being cut away above the sole bar, causing the latter to form a wooden spring; also the construction of waggons with radial axle-boxes curved in opposite directions, and which may have also two or more rigid or sliding central wheels; also a mode of obtaining “ radial movement of wheels and axles, either one pair or two pairs, grouped by radial plates or bars; ” and also a mode of using liquid fuel or petroleum “ by injecting it in fine streams with compressed air or



“ incandescent substances ; ” all these particulars being fully set forth.

The specification also illustrates and describes a wheel of metal cast hollow to contain oil, so as to dispense with revolution in the axle boxes.

[*Printed, 1s. Drawings.*]

A.D. 1863, December 21.—No. 3216.

CLARK, WILLIAM, and BATHO, WILLIAM FOTHERGILL.—Road roller and traction engine. The road roller, thus described by the patentees, may be used as a traction engine, if the weight be thrown on the central parts of the rollers, and as a stationary engine if the rollers be thrown out of gear.

“ We make a machine or apparatus in the form of an ordinary perambulator, the front roller or wheel being of such a width as to cover the ground between the two hind rollers or wheels. In order to facilitate the turning of the machine, we form the front roller or wheel of three separate parts, each working loose on the axle, the centre part being somewhat larger in diameter than the two outer parts, and working on a portion of the axle eccentric with those portions on which the two outer parts of the roller ” rotate.

“ The steering apparatus, of which the front roller forms part, consists of a horizontal ring or turntable which encircles the three parts of the roller and carries the axle bearings, the said table being free to revolve on antifriction bowls placed so as to support the vertical weight and resist the lateral thrust. We employ suitable gearing for enabling the steerer to turn the turntable and front roller, and to render this operation as easy as possible the front axle is turned partly round by means of a worm and worm wheel, so that the eccentric portion of the axle shall raise or relieve the two outer parts of the front roller from contact with the ground, and place the weight of the front end of the machine on the central part of the said roller. The hind rollers or wheels have separate axles, and are each in two parts, the inside parts serve as driving wheels, and are larger in diameter than outside [parts, and each inside part works upon an eccentric portion on its corresponding axle, and for raising the outside parts from the ground when required,

“ worms and worm wheel are employed, similar to those for  
 “ raising the outside parts of the front roller. We fix a steam  
 “ engine and boiler on a framework or platform supported by  
 “ the axles, and prefer to make the boiler vertical and multi-  
 “ tubular, and the engine with at least two cylinders, the ma-  
 “ chine being driven by link or pitch chains direct from the  
 “ crank shaft of the engine, or if more power is desired,  
 “ toothed gearing may be added.”

[*Printed, 1s. Drawings.*]

A.D. 1863, December 23.—No. 3245.

WALTER, ROBERT.—(*Provisional protection only.*)—“ Safety ”  
 cabs.

“ A strong vertical bar or rod is centrally situated between  
 “ the shafts and immediately behind the ‘ splash board,’ and  
 “ extends from the floor to the roof of the vehicle, giving  
 “ greater strength and durability to the front thereof; to this  
 “ vertical support or strengthening tie rod the doors of the  
 “ vehicle are hung or suspended, which open outwards, and  
 “ which form when closed to the body of the vehicle a square,  
 “ curved, or angular front. A further improvement consists  
 “ in attaching by means of springs to the back of the cab and  
 “ underneath the driver’s seat an intermediate or central  
 “ wheel, effecting thereby greater steadiness, also equalizing  
 “ the strain when any undue or surplus pressure is exerted  
 “ behind the axle.”

[*Printed, 4d. No Drawings.*]

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A.D. 1864, January 1.—No. 3.

NOTTINGHAM, JOHN WILLIAM, and GORE, WILLIAM HENRY  
 POSTLETHWAITE. — Construction of carriages. The framing  
 of the carriage is made of angle iron or steel, and is put  
 together preferably by screw bolts, so that for transport the  
 vehicle may be taken to pieces. The framing is filled in with

panels of wood, papier maché, or other similar substance, not being metal.

[*Printed, 4d. No Drawings.*]

A.D. 1864, January 14.—No. 105.

PLUM, THOMAS WILLIAM.—Manufacturing tires. [This invention relates to making solid or weldless tires for railway and other wheels by means of coils of iron, according to the patent granted to Charles Cowper on the 23rd of May 1850, but such coils being in the present invention composed of bars of different form from those set forth in the specification of that patent, and being so shaped before coiling “as to be when  
“coiled either slightly convex or obtusely angular on one or  
“both of their sides, or of such form wholly or partially  
“curved, wholly or partially angular, or a combination of  
“curve and angle, of curve, angle, and flat, of curve and flat,  
“or angle and flat, as may be preferred or found most suitable for attaining the object of having the inner edges or  
“some point (the centre preferred) between the inner and  
“outer edges in welding contact before one or both edges are  
“closed.” Bars may also be used which have a groove on one side and a tongue on the other, “or with corresponding curve  
“or angle or other similar interlocking section.” Such bars may be arranged in circular piles for the production of circular blooms for solid tires, materials of different qualities being if desirable combined in one pile. A bar of one or other of the forms alluded to may be coiled round a mandril, and the coil thus formed be then cut through by sawing or other means, and so converted into a number of separate rings, the ends of which may or may not be welded together, but a pile of such rings being then heated and welded together either by hammering or pressure. Rings of different materials may thus be united together, and a tire may thus be formed with a flange and outer rim of tough iron, the centre or head of the tire being of hard iron.

In casting rings or ingots for wheel tires and other ring-shaped articles of steel, Bessemer steel, Bessemer iron, or other metal, the patentee casts them much thicker than the finished ring is intended to be, and much wider, thus allowing for the reduction which takes place by hammering or pres-

sure, and also for the formation of a flange, the latter not being formed in the casting.

The invention further relates to arrangements connected with the fixing of armour plates upon the sides of ships and batteries which do not require notice here. And the last part of the invention consists of an improved hammer, the block or top of which is provided with a well hole formed vertically through it, for the purpose of admitting a guide rod which serves as a mandril, and may be of any suitable shape for producing the required internal figure of the ring or other article under operation. This mandril is secured to the hammer block by a pin or latch or other suitable contrivance so as to admit of its removal therefrom when requisite.

The invention may be applied to the manufacture of bosses, guns, and other articles, in addition to wheel tires.

[*Printed, 8d. Drawing.*]

A.D. 1864, January 19.—No. 140.

JENNER, GEORGE.—Sun blinds for carriage windows. The invention consists in the roller having “a band, cord, or chain  
“ at each end, and passing either over a sheave attached to  
“ the roller at each end, or over the roller without the sheaves,  
“ and under a pulley fixed on each side and below the level of  
“ the bottom rod of the blind when drawn down to its fullest  
“ extent, the band, cord, or chain being attached to the  
“ bottom rod on each side, so that by pressing the bottom rod  
“ either up or down the motion is conveyed to the roller,  
“ through which the blind becomes self-winding, and will remain stationary at any height required. The sheaves at  
“ each end of the roller may have studs or pins inserted in  
“ the barrel at equal distances to form a sprocket wheel, and  
“ the bands, cords, or chains have corresponding holes to lock  
“ on the studs or pins inserted in the wheel to prevent their  
“ slipping. When used without the sheaves or sprocket  
“ wheels, the bands, cords, or chains are fastened to the roller.  
“ The pulleys, bands, cords, or chains, and also the roller are  
“ concealed from view, as well as protected from injury, by a  
“ thin wood casing, in the top part of which a small chase is  
“ formed to allow the blind to pass through, and a corresponding chase on each side to guide the bottom rod up

“ and down; the ends of the rod being flattened to fit the chase.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, January 23.—No. 201.

CHAPMAN, WILLIAM.—(*Provisional protection only.*)—“ Improvements in traction engines and vehicles for common roads.”

The inventor says :—“ The improvements consist in the employment of an endless suspension railway composed of an endless series of rails hinged or jointed together, which is carried by a pair of circular or polygonal shaped carrying wheels revolving clear or out of contact from the ground, upon independent axles of their own carried by the framing of the vehicle. The driving or supporting wheels of the vehicle are situate between and in a line with the wheels which carry the endless railway, so that they run upon the rails laid down for them by the carrier wheels. The rails, which are of steel or wrought iron, I prefer to make a bridge section, the broad flanges resting upon the ground, whilst the supporting or driving wheels of the vehicle bear upon the raised portion of the rails; they are jointed together end to end, so as to form a continuous series, and may have filling pieces of wood fitted on them to prevent noise, and cause them to fit accurately on to the circumference of the carrier wheels, whether such wheels be circular or polygonal. In some cases small revolving brushes driven from the carrier wheels may be employed for keeping the wheel bearing surface of the rails free from sand or dirt. Any convenient or well known steering apparatus may be fitted to the fore part of the vehicle.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, January 25.—No. 207.

TASKER, WILLIAM.—(*A communication from Joseph Mellor.*)—(*Provisional protection only.*)—“ Improvements in drays or carts.”

“ This invention relates to means of moving the load or regulating and adjusting the weight of it on the wheels as may be required, when ascending or descending a hill, also to

“ applying a brake in descending and a skid in ascending, and  
 “ consists in having the body of the dray or cart not fixed to  
 “ the axle as heretofore, but capable of sliding in suitable  
 “ plates or slide frames, and to give ease of motion friction  
 “ rollers are introduced betwixt. Motion is given thereto by  
 “ a hand wheel and screw shaft from either end, or other convenient  
 “ part of the dray or cart, which operates a lever arm  
 “ fixed on a shaft extending across the body (underneath)  
 “ having a lever at each end connecting to the side frames.  
 “ The brake is applied to the rim of the wheel, and one is  
 “ fixed on each side of the body by spring brackets in slide  
 “ frames, so as to be capable of being readily adjusted by set  
 “ screws or other suitable means to a proper position to  
 “ operate on both wheels when the load is moved back for  
 “ descending a hill. The skid is attached to the body of the  
 “ dray or cart, so as to be readily placed and held in or out  
 “ of action by thumb-screw or other convenient means when  
 “ ascending a hill.”

[Printed, 4d. No Drawings.]

A.D. 1864, January 25.—No. 209.

KcKENZIE, ALEXANDER. — (*Provisional protection only.*) —  
 Hinge for carriage heads. “ The object of this invention is  
 “ to enable the joint of the hinge to be brought as far forward  
 “ as possible, so that when the head is folded back the front  
 “ part of the ‘pillar top’ in a landau (or of the front frame  
 “ of the head of a barouche or other carriage) shall not project  
 “ above the top of the hinge, and also to dispense with  
 “ the necessity for bringing the top flap of the hinge in front  
 “ of the woodwork.

“ In carrying out this invention,” says the inventor, “ I  
 “ construct the lower part of the hinge of such a form as to  
 “ throw the joint of the hinge as far forward as possible, and  
 “ I form the upper flap of the hinge with a crank or elbow  
 “ curved or bent backwards in such a manner as to bring the  
 “ same to the back of the ‘pillar top’ or woodwork, and I  
 “ fasten the upper flap of the hinge to the latter by screwing  
 “ it on from behind. By these means the joint is made almost  
 “ invisible, the front woodwork of the head does not project  
 “ above the hinge when the head is folded back, and the flap

“ of the hinge, instead of being screwed in front of the  
“ woodwork, where it is unsightly and requires very careful  
“ fitting in order to allow the window or blind to slide up and  
“ down freely, is hid away entirely out of sight behind the  
“ woodwork, where it does not require such careful fitting.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, January 27.—No. 231.

GRAFTON, SIDNEY.—Hand rail for vehicles. This invention relates to the “ application of travelling hand-holds to the  
“ roofs and other parts of vehicles, such as omnibuses, and  
“ consists in the application of longitudinal rods, on which  
“ are placed pullies to run thereon; to the axes of these  
“ pulleys depend handles suitable for a passenger to take  
“ hold of to steady himself in walking along in the vehicle,  
“ as in walking up the centre of an omnibus, the passenger  
“ holds the handle while the pulley runs along the rod. When  
“ the handle is released, it runs back to the position from  
“ which the passenger brought it by reason of the inclination  
“ of the bar on which it is placed. In order that passengers  
“ may also assist themselves in the opposite direction,” the  
patentee employs “ two bars and pullies with handles, the one  
“ bar being inclined in the opposite direction to that of the  
“ other, so that the handles run to the opposite ends of the  
“ vehicle; more than two bars may be used, but they should  
“ be of less length, and with handles traversing from the door  
“ or access to an intermediate point.

“ Instead of rods to carry the pullies and handles, projec-  
“ tions or ledges from the roof may be adopted, the object  
“ being to carry a traversing handle, which it is not necessary  
“ to release until the passenger has arrived at his or her seat  
“ in the vehicle.”

[*Printed, 8d. Drawing.*]

A.D. 1864, January 28.—No. 237.

RODGERS, JOSEPH.—“ Improvements in the construction of  
“ railway and road wheels, of road wheel arms or axles, and  
“ also of pulleys and drums.”

This invention has for its object the increased durability of  
the tires of railway and other wheels, and of drums and

pulleys, and also the easy removal and renewal of the axletree bushes and bearings of common road wheels.

Various methods of effecting these objects are set forth. In railway wheels the rim is formed with a recess in that part which comes under the "tread" of the tire, there being placed in this recess, either in a heated or a cold state, a single or double hoop of wood, composed of a piece or pieces, curved or bent from straight lengths to the required diameter, and spliced or "jump-jointed" together. The spokes are formed "in the V shape usual in railway wagon wheels," a packing of wood being inserted between the contiguous arms of the spokes. Or such spokes may be of various sections, rectangular, oval, parabolical, or otherwise, the boss or nave of the wheel being of cast iron, and the packing between the arms passing for a short distance into the nave or boss. The tire may be shrunk upon the recessed rim in the ordinary manner, the wooden hoop or hoops projecting above the same; or in wrought iron wheels the tire may be recessed and fitted with a hoop or hoops.

For road wheels a similar arrangement of spokes and rims may be used; or the packing between the spokes may be omitted; or where a broad wheel is required the patentee uses two broad thin plates, the lower one being attached to the rim of the wheel, and having a wooden hoop or wooden hoops fixed on the central part, the other plate being placed outside such hoop or hoops, two rings of iron being placed at the external edges of the latter, and an ordinary tire shrunk on the whole. The axle box of such a wheel may be composed of a wrought iron tube, having the outer end closed and the inner end screwed internally by preference to receive a nut which prevents the escape of the oil. On the middle of the bearing is placed a collar, and the second bush or bearing receives the extreme end of the axle or bearing, "a neat compact axle box" being thus obtained. The bush or bushes being separate from the box may readily be removed and are provided with lugs, recesses being cut in the axle box to enable them to enter, and the bushes being secured in the box either by keys or by recesses adapted to the lugs, or by both methods. The bushes may be of cast iron, chilled or otherwise, of other metal or of an alloy "grooves being cut " on the external surface of the axle box or that portion



“ where the nave or boss is required.” These arrangements are more especially adapted for common waggons, but for superior vehicles a tube is used as in the other case, a flanch being provided on the periphery of the tube, and furnished with recesses to receive the ends of the spokes of the wheel, such spokes being pressed against the flanch by means of a cap, the latter being bored out to receive the arm or axle, and a plate being placed between the end of the tube and the cap, escape of oil being thus prevented. Various modifications of these arrangements are described.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1864, January 30.—No. 253.

THOMSON, ROBERT BURNS.—(*Provisional protection only.*)—Applying brakes. This invention relates to certain improvements in and application of mechanism to carts, and other vehicles “ for the purpose of reducing the downward pressure “ upon animals in draught when descending hills, and consists in the application of a brake to the top or sides of “ each or all the wheels.”

One mode of carrying out this invention “ consists in placing “ transversely below the bottom or floor of the cart a rod or “ bar, having on one or both ends of it a bracket lever, to “ which a brake block or blocks are attached (these blocks “ by preference being made of willow wood), and on the side “ opposite to that on which the blocks are placed another “ lever is fastened, it being actuated upon by a screw or “ cam actuated by the driver’s hand; or this lever may have “ attached to it a footboard to be acted upon by the pressure “ of the driver’s foot. In either of these arrangements, “ when the lever acted upon by the driver is depressed, the “ rod or bar goes through a small portion of a revolution and “ thus brings the levers carrying the brake blocks in frictional “ contact with the periphery of the wheels.

“ The intention or object of the invention is to apply “ manually or pedally actuated brakes to such vehicles that “ have not hitherto had this advantage.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, February 5.—No. 308.

**BROOMAN, RICHARD ARCHIBALD.**—(*A communication from Alfred Charles Fleury.*)—Brakes. This invention “is applicable to the axles or spindles of locomotives, wagons, steam and hydraulic engines, to fly wheels and driving pulleys, as well as to the wheels of carriages, that is to say, that in every vehicle, apparatus, or appliance in which an axle or spindle turns, this break is applied to the axle or spindle, and that in every vehicle, apparatus, or appliance in which the spindle is stationary the break is applied to the wheel pulley or other moving part.”

An arrangement is described as being suitable for a railway waggon in which there is fitted upon one of the axles of the waggon a toothed disc, a block being mounted above it which is capable of sliding up and down, a spring tending at all times to press it downwards, but being prevented from doing so until requisite by a chain or cord attached to a bar which may be placed in any desired position, and actuated by the hand or foot by means of a second chain or cord passing round certain pulleys. The bar slides in a guide, and it and the block are held up when raised by means of a catch, which on being disengaged, allows the block suddenly to descend and enter between two of the teeth of the disc thus stopping the rotation of the axle, which in this case has the wheels fixed thereon, the movement of the wheels thus being stopped also. A sliding bolt is so mounted under the carriage that on the descent of the block it enters a hole in the latter and so prevents it from being forced away from the disc by the teeth of the latter.

Such a brake may be actuated by steam which may be caused to act upon a wheel so as to turn it in either direction at pleasure. “In locomotives the bar would be furnished with a slide arranged to act as a steam-cock, and with a second slide which will open the cock for the escape steam to assist in stopping the train,” and the break “may be fitted to each wheel of the locomotive, and to the last carriage, with communication, if desired, between the bars by electricity.”

In the case of a vehicle having a fixed axle with the wheels

revolving thereon, the disc is not attached to the axle but to the nave of one of the wheels.

[*Printed, 1s. Drawings.*]

A.D. 1864, February 17.—No. 404.

TESTUZ, FRANÇOIS.—Brake. This invention consists “in the  
“ construction of certain mechanism by means of which two  
“ blocks of wood or other suitable material are brought to  
“ bear from opposite directions upon each periphery of the  
“ two wheels upon the same axle of a railway or other  
“ carriage simultaneously. The blocks of wood are fixed  
“ upon transverse bars reaching from one wheel to the other,  
“ and these bars are freely suspended from the frame of the  
“ carriage, one in front and one behind each pair of wheels  
“ to which the brake is to be applied.”

A modification of the invention is described in which a shaft mounted in suitable bearings passes across and below the framing of a railway carriage, but immediately above the axles, this shaft carrying at each end a double lever, the arms of which are so curved that the lever resembles the letter **S**, a rod being jointed to each end of each lever, and passing thence to a brake block, one of which is suspended by suitable means on each side of each wheel. On each of the shafts first mentioned is also a straight lever, this again being connected by a rod to a screw block or nut which is placed on the screwed part of a longitudinal rod which extends below the carriage, by causing which to rotate the screw block is moved so as to apply the brake blocks to or release them from wheels at pleasure. The longitudinal rod of one carriage is connected with that of another by a suitable joint, the parts of which are capable of sliding one in the other, and a hinge being so arranged as to prevent the parts of the joint from receiving a shock when two carriages are being brought together.

According to another arrangement a longitudinal rod having screwed parts therein is provided with screw pieces or nuts which are connected directly through the medium of rods to the brake blocks, the screw parts for each pair of blocks having the threads cut in opposite directions, so that the shaft or rod being turned the blocks are moved either towards or from the wheels, as requisite. This arrangement,

however, is only meant for application to the wheels of one side of a carriage.

This invention is applicable not only to railway engines and vehicles but also to carriages for common roads.

[*Printed, 1s. Drawings.*]

A.D. 1864, February 18.—No. 415.

HOFMANN, JULES ROBERT.—(*Provisional protection only.*)—Releasing runaway horses. The following is the inventor's provisional specification:—

“ My invention consists in a series of double rings with  
 “ bolts and springs to be applied to all sorts of harnesses,  
 “ carriages, carts, vans, and other vehicles, by means of  
 “ which the horses can be instantly released from the vehicle  
 “ in case of danger. To attain that object I use, instead of  
 “ the roller bolts or hooks ordinarily fixed on the splint bar  
 “ of the carriage, a series of double rings, between which  
 “ the loops of the tresses are fastened by bolts, of which the  
 “ driver has full command to remove instantly by means of  
 “ a chain, cord, strap, or other fastening leading from the  
 “ seat and attached to the bolts, thus releasing the horses  
 “ from the vehicle when required. I use the same system  
 “ of double rings to the end of the pole of the carriage,  
 “ where they are kept in their proper place by a spring which  
 “ gets loose by the pressure of the rings when the horses go  
 “ forward.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, March 23.—No. 732.

MOREL, AUGUSTIN.—Traction engine. The improvements described in this specification relate to a previous invention for which Letters Patent were granted to the present patentee, dated 19th June 1863, No. 1538.

The engine consists of two parts, the front part swivelling round a perch pin, to one side or the other for steering purposes. A rack and pinion driven by power effect this motion. One of the present improvements consists in mounting a second pair of engines upon the after part of the framing. These engines only drive the hind wheels by means of bands and pulleys. The other pair of engines is mounted on the

fore part and drives the fore wheels and only turns in one direction, in this respect unlike the hind engines. The steam is supplied first to the fore engines, thence it passes through the perch pin to the second engines or is allowed to escape as the case may be. The boiler furnace is adapted to burn liquid or other fuel. The seat for the steersman in front is mounted so as always to face in the direction which the vehicle is taking for the time. "Circular and conical brakes fitted "on the axle" act "on the pulleys of the hind wheels." Toothed gearing may be used instead of driving bands and pulleys. The tension pulleys are so arranged that when the traction engine describes a curve, the outer wheels travel more rapidly and the tension pulley is at the same time taken off the inner side so that the bands slip on the driving pulleys. The wheels are mounted on long metal sockets forming the nave and carrying the band and brake pulleys.

[*Printed, 10d. Drawing.*]

A.D. 1864, March 23.—No. 733.

WINBY, WILLIAM EDWARD, and WHARTON, WILLIAM.—(*Letters Patent void for want of Final Specification.*)—Springs. The object of this invention is to permit the several plates forming the spring "to be brought together and play freely "in a longitudinal direction while preventing lateral motion, "and that without weakening the plates by slots cut through "them as in ordinary springs, consequently dispensing with "the use of pins or studs working in the slots." The invention is illustrated by a drawing containing a large number of figures, in some cases the plates of which the spring is composed being so rolled or shaped as to "tie or bed in each "other when superposed," without the aid of any intermediate key or fastening, and in other cases round or square key pieces being placed in longitudinal grooves made in the plates, the latter being in all cases secured in position by the ordinary bands.

[*Printed, 8d. Drawing.*]

A.D. 1864, March 24.—No. 750.

ROBERTS, WILLIAM.—(*Povisional protection only.*)—Traction engines. The inventor, to use his own words, arranges the

engine as follows :—" The framing of the engine is supported  
" on four wheels, two driving wheels at the back, and a pair  
" of smaller locking wheels in front. Near the back of the  
" framing a vertical boiler is mounted with the tank for  
" supplying it with water beneath the framing; the cylinder  
" or cylinders of the engine are fixed at the front of the  
" framing, and in an inclined position; it works back to a  
" crank shaft carried on standards at or near the centre of the  
" carriage. On this shaft are two spur wheels, either of  
" which may be made to gear with the spur wheel on an  
" intermediate shaft. There are chain pinions at each end of  
" the intermediate shaft, and these by pitch chains drive  
" chain wheels fixed to the driving wheels. I prefer that this  
" shaft should be made in two parts, being divided in the  
" centre, the ends of the two parts being in contact and  
" butting together. Each part has a bevelled wheel fixed  
" upon it, and between the two bevelled wheels, and turning  
" loosely on the two parts of the axis is a frame with a bevelled  
" pinion or pinions gearing with both the bevelled wheels.  
" This arrangement is made in order that one of the driving  
" wheels may be able to rotate more rapidly than the other.  
" The wheels on the crank shaft can also be made to gear  
" with other wheels on another intermediate shaft, and this  
" by bevelled gear drives an upright axis with a pinion at its  
" lower end, and this pinion gears with internal teeth formed  
" on the periphery of the drum. At the fore part of the  
" platform of the engine and projecting beneath it is the  
" vertical pin or axis of the locking motion; in this an eye is  
" formed, and the axle of the fore wheels passes through it,  
" and is secured by a horizontal pin or axis on which the axle  
" pivots, so that the wheels may adjust themselves to any  
" inequalities of the road; the steerage is obtained by the  
" turning of the vertical axis by which the axle is carried.  
" The drum for working the chain, rope, or band is mounted  
" on the vertical pin or axis of the locking motion, and it is  
" placed under the axle of the fore wheels. If the engine  
" is to be used for traction purposes only the drum is  
" omitted."

[*Printed, 4d. No Drawings.*]

A.D. 1864, March 26.—No. 763.

SYMES, JAMES.—“Improvements in locomotive apparatus or  
“conveyances applicable to land and sea.”

The following is the patentee's description of his invention:—“I construct a spherical vessel or globe of iron of any  
“required dimensions, say, fifty feet in diameter. This hollow  
“globe is to be furnished with an axle passing directly  
“through its centre, to which axle a boat or other receptacle  
“is slung; this receptacle is also built of iron, and if it be  
“formed of a spherical shape, its upper half may be of zinc  
“or other light material sufficient for a covering to protect  
“the inmates from draught and cold. A steam engine of  
“about 30 horse power is to be fixed in the suspended re-  
“ceptacle or chamber so as to propel the axle in the globe,  
“causing the globe to revolve around the chamber, which  
“remains level and dependant from the axle; an opening is  
“made on each side of the globe for ingress and egress, and  
“for ventilation and the escape of steam or smoke. The  
“interior is fitted either for carrying mails or cargo. The  
“axle or shaft extends beyond the periphery of the spherical  
“vessel, and serves to sustain a chamber for the steersman,  
“who operates with a rudder suspended therefrom. On sea  
“the vessel would draw about 10 feet of water, and would  
“roll or revolve over the surface with great rapidity. The  
“vessel would also be applicable for discovering the sources  
“of large rivers, or for exploring and traversing sandy  
“deserts. In the latter case, the propelling action would be  
“the same as for water passage, the apparatus revolving  
“along the surface of the ground, but the steering would be  
“accomplished by means of guide wheels let down as trails  
“in place of rudder, which would be removed and secured in  
“the interior of the apparatus.”

[*Printed, 8d. Drawing.*]

A.D. 1864, March 31.—No. 805.

HOLBROOK, WILLIAM.—Window sashes. This invention consists in certain improvements in the construction of window sashes, applicable, among other purposes, to railway carriages, omnibuses, and other situations, the objects of the invention being “to enable the window to be easily raised or

“ lowered and maintained in any desired position ; to be  
 “ proof against wet or the draught of air, and to be noiseless,  
 “ either from the action of wind, or the motion of a railway  
 “ carriage or other vehicle.”

The sash frame is constructed in the ordinary manner, with an inside beading, a cavity being formed in the sash frame for the admission of a “ biting roller ” attached to a face plate, certain horizontal pins, guides, and springs, and a piece of india-rubber being used to render the opening and closing of the window more easy.

[*Printed, 8d. Drawing.*]

A.D. 1864, April 13.—No. 934.

COPE, JAMES.—Engines for steam ploughing and traction purposes. Parts of these improvements relate to modes of adapting the disc anchor and supporting the rope drum horizontally on friction rollers under the boiler. “ Another  
 “ improvement consists in mounting horizontal boilers in  
 “ such a manner that one end thereof may be raised or  
 “ lowered, in order to keep the same in a horizontal position  
 “ when the engine is going up or down hill. To this end the  
 “ end of the boiler is supported upon a screwed cylinder or  
 “ tube, in which works a nut, which may be moved up or  
 “ down in this cylinder by means of any suitable gearing  
 “ under the command of the attendant. Or the boiler may  
 “ be supported by the piston rod of an hydraulic cylinder, so  
 “ that by forcing the water into the latter the end of the  
 “ boiler may be elevated to the required height, and there  
 “ retained as long as may be desired. This hydraulic  
 “ arrangement may be made self acting by adapting to the  
 “ cocks a vibrating lever or ball, which as the level of the  
 “ ground varies will act upon and open the water valves or  
 “ cocks. The same effect may be produced by cranking the  
 “ axle of the running wheels, and attaching the boiler in any  
 “ convenient manner thereto, so that by turning the axle on  
 “ its centre of motion the end of the boiler will be raised or  
 “ lowered as required.

“ The last improvement consists in giving to the axles of  
 “ the running wheels the facility of rocking on a centre, so  
 “ that the axle may always preserve its parallelism to the



“ surface of the ground, and the running wheels be always  
“ allowed to rest thereon. The engine will thereby work  
“ equally well, and without strain on any of its parts, even  
“ when one wheel may be on considerably higher ground  
“ than its fellow.”

One mode of effecting this object is shown. To the fore part of the boiler is secured a short cylinder in which is inserted the end of another cylinder to which is attached the axle of the front pair of wheels. The outer edge of the upper end of the latter cylinder and the inner edge of the lower end of the former cylinder are both bevelled so as to admit of the inner cylinder being rocked on its centre of motion. It will also be seen that one cylinder may be turned round horizontally when required carrying the running wheels with it so that the engine may be steered in any direction.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1864, April 15.—No. 946.

DURANT, ANGUISH HONOUR AUGUSTUS, and GORE, WILLIAM HENRY POSTLETHWAITE.—Hansom cabs, &c. This invention applies chiefly to the construction of Hansom cabs and more particularly to such Hansom cabs as are made according to the specification of Letters Patent granted to William Nottingham, No. 2573, A.D. 1863.

“ In constructing these cabs,” say the patentee, “ we make  
“ the framework of the cab of corrugated iron, for the purpose of combining strength and lightness, and when a rigid  
“ head is used, as described in the said specification, we  
“ mount the same on an excentric hinge, or we place the  
“ pivots (upon which the head turns over) in grooves or slots,  
“ so that as the head is turned down it shall at the same time  
“ slide forwards so as to be out of the way of the driver’s  
“ knees ; or instead of making the head of the cab in a rigid  
“ form, we propose to make the top part of the head flexible,  
“ and (when the latter is thrown back) either to slide in  
“ grooves at each side close to the back of the cab, or to wind  
“ on to a roller placed in a box below the footboard of the  
“ driver’s seat, or elsewhere, the object being to allow of  
“ more room for the knees and feet of the driver than in cabs  
“ constructed precisely according to the specification of the  
“ aforesaid Letters Patent.

“This part of the invention is also applicable to other  
 “wheeled carriages made with a head to turn over on  
 “pivots as described in the said specification.

“Another part of our invention applies to ‘Hansom cabs’  
 “generally, and to other wheeled carriages and perambu-  
 “lators and consists in constructing the door or doors of cabs  
 “or carriages (or a portion thereof), and the apron of peram-  
 “bulators, in the form of a flexible shutter, sliding in grooves  
 “at the sides, and capable of being pushed down so as to  
 “wind on to a roller placed in a box fixed upon or beneath the  
 “floor of the carriage, and having suitable catches or fasten-  
 “ings to secure the same when drawn up.

“A third part of our invention, applicable to all kinds of  
 “wheeled carriages, consists in dispensing with the ordinary  
 “plate springs, and placing a flat coiled spring between the  
 “axle and the body of the carriage, or between the axle and  
 “the box of the wheel.”

[*Printed, 8d. Drawing.*]

A.D. 1864, April 15.—No. 947.

SCOWEN, THOMAS LAIZELL.—Canopy or sun shade. This invention relates to improvements upon a former invention, No. 1078, A.D. 1857. These improvements are thus described :  
 “The stem or standard supporting the canopy for small  
 “carriages made in one piece in lieu of jointed standards, as  
 “described in the above patent, and other stems to be made  
 “telescopick with set screws. The head or centre of action  
 “where the ribs hinge in to be made in one piece with hole  
 “in the centre for the purpose of receiving the end of stem  
 “in lieu of plates attached. A socket to attach to the car-  
 “riage with the hole for the stem of canopy to pass through,  
 “and a set screw to socket to fasten or hold the stem of  
 “canopy at any height required. Also a socket with set  
 “screws, having an action partially similar in effect to the  
 “universal joint, to admit of the canopy leaning forward or  
 “on either side. And a socket and ferrule for jointed stem,  
 “having corresponding clutches to prevent the stem turning  
 “round, each part of the stem being made fast, the one part  
 “to the socket the other to the ferrule. The use of the  
 “tubular or grooved ribs. The centre line or seam of the

“ two halves of the canopy cut slightly sloping from the  
“ centre, so as to cause the edges to bow down, with a cord  
“ in the edge to keep it firm and in shape, in lieu of cutting  
“ angular slips out round the edges and seaming them up, as  
“ described in the aforesaid patent. The cover made in one  
“ piece with a slit from the centre to edge to allow of the  
“ canopy folding. A canopy made in the shape of a leaf.”

[*Printed, 8d. Drawing.*]

A.D. 1864, April 27.—No. 1057.

SOUTHGATE, THOMAS LEA.—(*Provisional protection only.*)—  
Awning for omnibuses. To the top of the omnibus is fitted a frame to carry the awning. This frame is supported at the centre of front and back by strong uprights, and at the four corners by light metal rods, all which supports are capable of sliding up and down in sockets, by means of rack and pinion gearing, so as to depress the framing when the vehicle is passed under arches or otherwise. The roller for the awning is carried longitudinally by the centre of the framing and is protected by a cover of metal. Each of the rods to which the lower edges of the awning are attached is guided by a metal tube with a longitudinal slit in which runs guides attached to the rods. Little pulleys and cords or chains fitted in the guide tubes serve to work the awning rods.

[*Printed, 4d. No Drawings.*]

A.D. 1864, April 28.—No. 1066.

MELLING, RICHARD, junior. — Wheels. The invention is thus described by the patentee:—“ My invention consists in a  
“ new combination of parts forming an improved construction  
“ of the wheels of carriages or vehicles for common roads.  
“ The spokes are made of malleable metal and are secured in  
“ the nave when it is cast, the nave being formed of cast  
“ metal. The nave has a bush in it formed of wood, which  
“ has another bush in it formed of metal to work upon the  
“ axle; this wooden bush acts to check or deaden the vibra-  
“ tions arising from concussions upon the wheel. The cast  
“ metal nave is hooped at its ends by malleable metal hoops.  
“ The end of each spoke is made to span or grasp the felloe  
“ (formed of wood) and the tyre and felloe are secured to the

“ end of each spoke. The felloes formed of wood are hooped  
 “ by the tyre in the usual manner.”

[*Printed, 8d. Drawing.*]

A.D. 1864, May 4.—No. 1120.

MC DOWELL, JOHN.—Improvements in two wheeled carriages. These improvements consist firstly “ in pointing the  
 “ shafts a little in front of the rear end to the body of the  
 “ vehicle, or to a scrolled stay affixed to the body, and  
 “ attaching to the rear end of each shaft a flat longitudinal  
 “ spring, which may be linked to the body of the carriage,  
 “ or to a C spring attached to the stationary stay, or to the  
 “ body of the carriage. When these stationary scroll stays  
 “ are used it is preferred to form the inner ends thereof with  
 “ cup heads to receive the front ends of the side springs of  
 “ the vehicle. In lieu of the longitudinal springs at the end  
 “ of the shaft, the shaft itself may be sufficiently elongated  
 “ to be immediately linked with the C spring, or to the body  
 “ of the vehicle, or it may be connected with the upper and  
 “ lower portion of the vertical C spring by straps of india-  
 “ rubber or helical springs. When india-rubber straps or  
 “ helical springs are applied, they may be connected to the  
 “ body of the vehicle, in which case the C spring or stationary  
 “ stay or both may be dispensed with by jointing the shafts  
 “ to the fore part of the body of the carriage, and allowing  
 “ the hindermost end of the shaft to extend sufficiently  
 “ backwards to give the requisite play to the springs con-  
 “ nected with the inner end thereof.”

The second part of the invention consists in the construction of open vehicles in which passengers sit back to back  
 “ with a body having a scrolled back resembling the front,  
 “ and jointing the back footboard to the body of the carriage  
 “ by a rule or table joint, so that the same may be turned up  
 “ when not in use, and covering the under side of the joint  
 “ with leather or other suitable material to hide the opening  
 “ which would otherwise be visible when the hinder footboard  
 “ is turned up. By the use of the rule or table joint the  
 “ ordinary straps or chains used to support the footboards in  
 “ such vehicles are dispensed with.”

The invention also consists “ in fitting the front and back  
 “ seats and the back rests which are on one frame with

“ spring lever catches, so that it can be readily moved back-wards or forwards a given distance.”

[*Printed, 8d. Drawing.*]

A.D. 1864, May 4.—No. 1130.

JARVIS, WILLIAM.—(*Provisional protection only.*)—Self acting brake. “ In applying the invention to carts, or other one horse vehicles, short rock levers are fixed, one on each shaft, and at the opposite ends of these levers are eyes or rings. To the lower eyes or rings are attached ropes or chains, which pass through guides carried by the body of the vehicle, and thence to break levers at the back of the vehicle. The brake surfaces of these levers are intended to bear against the periphery of the cart wheels, and they are kept out of action by means of strong springs mounted on the under side of the shafts. At the front of the cart is a crank shaft, or its equivalent, for holding the ropes or chains at tension, or slackening them at pleasure, which may be effected by rocking the shaft by a hand lever attached thereto. The eyes or rings at the upper end of the rock levers are connected to the breeching strap when that is used, so that the horse when pulled up will by pressing against the breeching strap rock the levers, and thus bring the ropes or chains to tension, and the brakes into action. When however no breeching is used the levers must be fixed near the saddle band, and connected thereto, when the same result, viz., the throwing into action of the brakes will be effected. In pair horse carriages where a pole is used, the levers are to be fixed to the carriage frame near the back end of the pole in such position as to allow the requisite amount of play for drawing the brakes into action. If thought desirable an additional brake or brakes to be operated by the driver as usual may be applied.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, May 5.—No. 1137.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Jean Marc Frainet. — (Provisional protection only.)*)—Wheels. This wheel has spokes of tubular iron of an oval section. They are connected with the nave and periphery by shoes of

iron or according to a modified design, by angle gripping pieces. In the former case these are wood filling pieces between the spokes at the periphery, the whole, that is the shoes, filling pieces iron rings or strakes and tire, being rivetted together. The nave is built up and means are provided to prevent the box from turning on the axle. The box is kept in the nave by reason of its conical shape and by a ring or flange bolted to the nave.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1864, May 6.—No. 1153.

TOMLINSON, JOHN.—(*Provisional protection only.*)—Steam carriage. The vehicle, which is described by the inventor as “ follows, is formed “ with single or double side plates, “ hollow or not, and between these outer and inner plates I “ place by preference, a cylinder on each side of a boiler, “ similar in form to the boiler of a railway locomotive, and “ I place a receptacle for fuel between the fire-box and the “ body of the vehicle partly under the foot plate and partly “ under the fore part of the vehicle where required. The “ bottom of the vehicle is hollow, and the space underneath “ the seats inside it is also hollow; such hollow spaces form a “ tank or tanks for water, and the space heretofore occupied “ by passengers in front seats in omnibuses or other vehicles, “ and the driver’s seat, I use as a receptacle for parcels or “ other goods, and instead of the outside passengers sitting “ in two rows, as heretofore the top of the vehicle may be “ arranged for two double rows; the space under the centre “ outside seats is open to the inside of the vehicle, access being “ obtained from the back of the vehicle to the outside or inside “ thereof. The body of the vehicle has a bearing at each “ side, with springs; these bearings are slotted with slots “ opening downward in which the axle is free to rise and “ fall, at each end of the axle is a driving wheel, provided “ with a drum which is attached to or forms part of the “ wheel, the wheels and drums revolve round the axle, which “ itself does not revolve but has a vertical motion in the “ slotted bearings, so that when the vehicle moves on a road “ having one side higher than the other, its equilibrium will “ be maintained, a driving belt is passed round each of the

“ drums and round two smaller ones, one at each end of a  
 “ cranked axle lying between the engine boiler and the fore  
 “ part of the vehicle, and driven by the two piston rods (or  
 “ links connected thereto) of the above cylinders, the small  
 “ drums are capable of being thrown in or out of gear when  
 “ required. Beneath the fore part of the engine a cylinder  
 “ projects, which is received by another cylinder in which it  
 “ works steam tight, and from one side of the outer cylinder  
 “ a lever projects which is connected with the ends of a chain  
 “ passed round two grooved pulleys attached to the main  
 “ framing. The chain is attached to any convenient apparatus  
 “ for moving it so that the lever and outer cylinder are  
 “ capable of being partially rotated. The outer cylinder has  
 “ underneath it, at or near its centre, a pin, hinge, or other  
 “ contrivance upon which an axle is free to turn vertically,  
 “ the axle also moving in spring slotted bearings similar to  
 “ those above described. The ends of the axle have only a  
 “ vertical motion, and are provided with wheels which  
 “ revolve upon it; the axle and wheels being partially rotated  
 “ by the chain as described, and steam being admitted into  
 “ the cylinders, the body of the engine will be raised by the  
 “ pressure thereof, thereby causing the vehicle to maintain its  
 “ level in going down hill; its level is maintained in going  
 “ up hill by taking off the pressure of the steam, thus allow-  
 “ ing the body of the engine to fall. A guage is placed  
 “ within view of driver and passengers to exhibit the pressure  
 “ of steam. There are levels by which the driver can main-  
 “ tain the horizontality of the whole apparatus.”

[Printed, 4d. No Drawings.]

A.D. 1864, May 12.—No. 1197.

MARTIN, CHARLES.—(*Provisional protection only.*)—Heads for carriages. This invention, which is susceptible of modification so as to be worked from the back of the carriage as well as from the front, and also to adapt it to various kinds of carriages, is thus described. “ On each side of both doors, in  
 “ the interior of the carriage, is fixed an arm or bar, the same  
 “ being attached to those parts of the door framing which  
 “ form a portion of the carriage head. A chain or belt, of  
 “ any material or materials suitable for the purpose, is passed  
 “ from each of the hinder arms or bars over pullies placed in

“ the interior of the back of the carriage, and thence passing  
“ over guide pullies to the anterior arms or bars to which it  
“ is fixed, is then carried round a disc or wheel placed trans-  
“ versely in the front portion of the carriage, the chain or  
“ belt from one side of the carriage being fixed to the top  
“ of the transverse disc or wheel, while the chain or belt  
“ from the other side is fixed to the bottom thereof. The  
“ said disc or wheel is mounted on the end of a shaft which  
“ is free to revolve in suitable bearings in front of the car-  
“ riage, the shaft passing beneath the box or driving seat,  
“ and being furnished with a lever by which it can be turned  
“ to the right or left. The shaft is provided with a ratchet  
“ wheel, a pall or catch being so arranged as to take into  
“ the same. Upon the lever being moved either to the right  
“ or left hand, the chain or belt so fixed to the disc or wheel  
“ as aforesaid will be drawn in a corresponding direction,  
“ thus actuating the before-mentioned arms or bars, and  
“ opening or closing the head of the carriage, the ratchet  
“ wheel and pall retaining it in any desired position.

“ Instead of employing the disc or wheel as above mentioned  
“ a roller may be used, the same being mounted in suitable  
“ bearings either horizontally or vertically. The chain or  
“ belt is fixed to the roller, which is actuated by a winch or  
“ handle.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, May 13.—No. 1213.

GOODRICH, ALFRED.—(*Provisional protection only.*)—Manual power carriages. The inventor says “in the front part of the  
“ body of the cart, in place of the ordinary seat, I fix a shaft  
“ on which are placed so that they may receive an oscillating  
“ motion from a person sitting thereon, one, two, or three  
“ chairs, according to the size of the vehicle and the number  
“ of persons to be employed in driving it; on the back of  
“ each of these chairs is fixed one end of a vertical lever, the  
“ other end of which is connected by means of a horizontal  
“ lever to another vertical lever placed some distance in front  
“ of the body of the carriage, the lower ends of the levers  
“ being jointed to the frame, so that they may receive a  
“ backward and forward motion. In front of these levers,  
“ and above the fore wheel or wheels of the vehicle, is an



“ axle with one, two, or three cranks, according to the  
 “ number of chairs in the vehicle and these cranks are con-  
 “ nected by means of rods with the front vertical levers, the  
 “ cranked axle carries at each end a large driving wheel,  
 “ communicating motion by means of a chain or band to a  
 “ pulley on the axle of the back wheels for propelling the  
 “ carriage. The backward and forward motion of the front  
 “ vertical levers may be assisted by means of small hand  
 “ levers attached to them. The vehicle may be turned round  
 “ at will by means of a hand lever attached to the fore wheel  
 “ or wheels, as in the velocipede. A lever may be placed in  
 “ front of the wheels for removing stones and other obstruc-  
 “ tions.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, May 13.—No. 1217.

HENRY, MICHAEL.—(*A communication from François Joseph Ducoux.*)—Indicators for vehicles. “There is an indicating  
 “ dial to shew the time, another dial to shew the distance,  
 “ and a third, the pointer of which is worked by a handle  
 “ under the control of the driver, shews whether the vehicle  
 “ be empty or whether hired at the regulation rate, or  
 “ otherwise, being marked accordingly. When the driver  
 “ moves the pointer to shew that the vehicle is empty, a  
 “ signal bearing a like inscription is raised by the same  
 “ action, but depressed when the pointer is moved to another  
 “ indication. A check or time register dial or face of card  
 “ or other substance is mounted on an axis, and marked off  
 “ into divisions of time, and it presents its surface to a tracing  
 “ point which marks it at intervals to correspond with the  
 “ time dial. A distance register dial or face of card or other  
 “ material, on which are marked a number of circles, is  
 “ mounted on a barrel or winding square, and held between  
 “ two plates, so as to exhibit the circles which are marked  
 “ off with divisions of distance, and correspond with the  
 “ indications on the driver’s dial. The registers are acted  
 “ on by the time clockwork and by the rotation of one of the  
 “ bearing wheels of the vehicle, whence various modes of  
 “ transmitting motion may be adopted, but the following is  
 “ preferred:—On the nave of one of the wheels is a truncated

“ cone, grooved to receive a ring, which, as the wheel re-  
 “ volves, imparts by means of a fork reciprocating motion to  
 “ a lever, which transmits such motion to a catch by a rod  
 “ fitted over a set of springs, which bear against the pole  
 “ pin. Bell movements may be added, but an excentric  
 “ or other connections may be used, springs being always  
 “ employed to keep the parts in gear, notwithstanding the  
 “ play motion and jolting of the vehicle. The catch drives  
 “ a toothed wheel, which through a train of wheels works  
 “ the pointer of the distance dial, and also a toothed wheel  
 “ which actuates a rising and falling spring lever or hammer,  
 “ which marks corresponding distances on the registering  
 “ dial. The wheel driven by the catch works a wheel with  
 “ studs, which drives a star wheel furnished with a spring,  
 “ and having on its axis an arm or crank, which works a  
 “ lever, whereby a tongue or spring carrying a tracing point  
 “ is worked and marks the register dial at certain intervals.  
 “ When the vehicle stops or is hired otherwise than at regu-  
 “ lation rates” the distance pointer “is thrown out of gear  
 “ with the bearing wheel, and put into gear with the time dial  
 “ or clockwork, so that motion is transmitted therefrom, the  
 “ star wheel continuing to act on the internal circle of the  
 “ register, but the lever and spring which marked on the  
 “ other circle of the register or circle corresponding to the  
 “ distance pointer are thrown out of gear with the bearing  
 “ wheel. Motion is transmitted from a barrel in connection  
 “ with a wheel connected with the hands of the clock or time  
 “ dial, and in gear with an escapement. The clockwork of  
 “ the time dial drives the pointer of the distance dial through  
 “ a train of wheels, one of which is engaged with another by  
 “ a spring lever. When the driver moves his pointer to show  
 “ that the hiring is otherwise than at regulation rate, he  
 “ moves a rack, which turns a wheel carrying studs and  
 “ having on its axis the pointer and on its surface a boss  
 “ which lifts a lever which throws the wheel which drives the  
 “ distance pointer out of gear with carriage wheel, and raises  
 “ another lever, and puts it into gear with the time dial  
 “ clockwork, a ratchet on the axis of the engaging wheel  
 “ being depressed when the wheel is out of gear. The lever  
 “ disengages the star wheel from the spring lever, which  
 “ keeps two wheels in gear, and when disengaged motion is

“ transmitted from the clockwork or time dial pointer to the  
“ distance pointer, which consequently marks the same distance  
“ as would have been travelled over in the time had the  
“ vehicle been moving. When the spring lever is in gear  
“ with the star wheel the latter disconnects the clockwork  
“ from the distance pointer, and the bearing wheel then acts  
“ thereon. As the driver moves his pointer to one or other  
“ of the indications on his dial, a wheel will act by projections  
“ or teeth on levers carrying tracing points, which  
“ mark on one or other of the registering circles. The  
“ register is returned to zero when there is a change of fare,  
“ or at other times; thus when the pointer shews that the  
“ vehicle is empty the above wheel works a spring lever, one  
“ end of which is forked and embraces the boss of the distance  
“ wheel, on the axis of which is a flat spiral carrying studs,  
“ by which it is engaged with the distance wheel. The spiral  
“ is on a barrel fixed to the axis, and carrying the distance  
“ wheel; a barrel spring acts on the spiral and on the distance  
“ wheel to bring the pointer back to zero by means of a lever  
“ having two arms, on one of which is a stud, which travels  
“ in the slots of the spiral, and the other is a stop, so that  
“ when the wheel is disengaged it is moved by the spiral and  
“ barrel spring till the stop abuts against a projection on the  
“ spiral and stops it in a position corresponding with the zero  
“ point.”

[*Printed, 1s. Drawing.*]

A.D. 1864, May 17.—No. 1239.

WILSON, THOMAS.—(*Provisional protection only.*)—Cabs and two-wheeled carriages. The invention is thus described in its application to a cab:—“ I make the sides of the cab inclined  
“ to one another, so that the end at which the doors are  
“ situated is wider than the other end. By this construction  
“ greater room for entering the cab is obtained. The wider  
“ or entrance end may either be at front or back of the cab.  
“ I make two doors to the cab, the said doors being situated  
“ at the wide end of the cab. The said doors are not hinged  
“ to the sides of the cab, but to an upright forming the extreme  
“ end of the cab, and midway between the sides of the  
“ cab. The doors when closed form with each other a nearly

“ right angle, and they form obtuse angles with the sides of  
“ the cab, against which they respectively shut. In opening  
“ the doors they are thrown outwards, and the cab may be  
“ entered from either side. When the doors are at the back  
“ of the cab, I connect with each of them moveable steps or  
“ foot plates, which are drawn out and closed by the opening  
“ and closing of the doors. When the doors are at the front  
“ of the cab the steps are stationary. The driver’s seat is  
“ fixed at the back of the cab. When the doors are at the  
“ back, the driver has direct command of them from his seat ;  
“ when they are in front, levers or handles working along  
“ the top of the cab enable him to open or close the doors  
“ without descending from his seat. Although I prefer  
“ placing the driver’s seat behind, as described, yet the said  
“ seat may be placed in front. When the doors are at front  
“ I make the junction of the shafts angular instead semi-  
“ circular, and I also make the dashboard angular, so as to  
“ permit the doors to open flat against the said dashboard.  
“ I fix the seat in the interior of the cab, by preference across  
“ the cab, as usual, and I provide the wheels with guard  
“ plates or boards to protect the passenger from dirt in entering  
“ and leaving the cab.

“ My invention consists, further, in making cabs and car-  
“ riages double, that is to say, I combine the two modes of  
“ construction described in one carriage, the said double  
“ carriage carrying four persons, two being seated in front  
“ and two behind, the occupants being seated back to back.  
“ The carriage has four doors and two wheels, and the driver’s  
“ seat may either be placed in front or behind.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, May 28.—No. 1328.

ETIENNE, ANDRÉ.—Improvements in carriages. This invention is described at considerable length and comprises numerous details. It relates firstly to methods of suspending two-wheeled vehicles. Long bearing springs covering each other are attached to the axle by one end and by the other support the body, while another and bow-shaped spring is fastened by its centre to the centre of the axletree and is placed longitudinally under the body. Again the patentee employs

two springs crossing each other at right angles, and presenting four points of support, on which he fixes a wooden frame upon which in its turn the carriage body is suspended by the intervention of two small springs on the frame, "so as to create a "double suspension."

The second part of the invention consists in various modes of constructing three-wheeled vehicles. The carriage is supported at the rear upon a pair of wheels in the usual manner. In front there is a strong poll bolt carried by side plates making a **V**. These plates support the driving box which also rests on a spring bearing on the top of the bolt. The single wheel is not dished and is carried in a frame fitted with springs and so arranged as to take shafts or splinter bar. In the case of an omnibus the hind wheels are placed between two bodies or compartments, each with a pair of doors, of which the whole vehicle consists. Seats are provided on the roof and moveable steps are fitted to the doors. There are umbrella stands and speaking tubes and also signalling cords. The conductor also has a lever brake. Three wheeled cabs are also shown and described, they are modified hansoms, with various dispositions of driving boxes and seats.

According to the third part of the invention four-wheeled vehicles may be suspended on systems of crossed springs with the addition of a perch.

To release runaway horses, the splinter bar is constructed so that the traces eyelets can be quickly liberated by drawing a cord or pressing a lever, the pole chains being separated from the pole by the forward pull of the liberated horses.

The improvement in axles is described as consisting of a nave containing an axle box which is slipped on to the end of the axle and secured thereon by means of bolts passed through first a washer on the axle and then the flange of the axlebox, the washer and the flange having between them a fixed flange on the axletree. Oil is introduced through an aperture in the flange.

The patentee further makes wheels of irregularly curved periphery, so that at given periods the wheel is to "acquire "an impetus." He also suspends vehicles on trunnions fore and aft to prevent overturning.

[*Printed, 2s. Drawings.*]

A.D. 1864, May 31.—No. 1347.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Jean Lamur.*)—Apparatus “for reducing the circumference of  
“ metal hoops, rings and tyres.”

The apparatus employed for the purpose of this invention consists “of movable hoops forming a frame, into which the  
“ ring or other circle, the diameter of which is to be reduced,  
“ is placed” such ring or circle then being “shrunk, after  
“ having been brought to red or white heat, by compression.” An arrangement is described in which a hoop is used for the purpose of compression, the two ends of this hoop not, however, being united, but one of them being connected to a rack, in gear with which is a pinion mounted upon a shaft carrying a wheel, which again is operated upon by another pinion fixed upon a shaft turned by a handle, the result of this being that the hoop is contracted in size and consequently the heated ring within it. The hoop is so arranged that by means of certain bolts, which may be placed in different holes, its size may be adapted to the reception of different sizes of rings; “but for extra sizes, change pieces may be substituted,” and other variations in the details of the apparatus made. As described above the invention relates only to compressing and so reducing the size of complete rings but similar apparatus may be employed to unite the two ends of a strip of metal meant to form a ring, the ends being heated, and “compressed  
“ or squeezed together.”

[*Printed, 10d. Drawings.*]

A.D. 1864, June 3.—No. 1379.

LEE, JOSEPH WILLIAM.—(*Provisional protection only.*)—Improvements in traction engines. These improvements relate to the previous inventions, No. 1331, A.D. 1861, and No. 2678, A.D. 1862. They consist firstly in a method of arranging the sliding axle described in the specification of the first of the above patents. The “axletree upon which the chain wheel is made  
“ fast is to be fitted” in brackets at the front end of the boiler. Provision is made in the bearings of the brackets for play of several inches so that the chain may be tightened. Secondly, to the counter shaft described in the specification of the second patent. This counter shaft is placed parallel with the

main axle and guard so as to allow of the free action of springs. The improvements relate, thirdly, to the arrangement of a fast and loose hauling drum. Fourthly, to a mode of attaching driving wheels to their axles by friction plates. Fifthly, to the addition of a spiral or volute spring to the centre of the front axle, or instead thereof a cushion of india-rubber. Sixthly, to the adoption of a "cover" for the fly wheel when the engine is travelling, and, seventhly, to the use of a carriage carrying an auxiliary cylinder and placed next to the engine. This cylinder is supplied with steam from the engine and serves as a supplementary source of power.

[*Printed, 4d. No Drawings.*]

A.D. 1864, June 3.—No. 1380.

ASHE, FREDERICK.—(*A communication from William Alsop Ashe.*)—Securing tires. This invention "relates to a method of securing the tires on wheels, and preventing them from slipping laterally, without the use of bolts, screws, or other fastenings. The improvement consists in forming upon the interior surface of the tire a rib or bead during the process of rolling the tire, which is to fit into a groove or channel made in the periphery of the wheel. The tire being heated expands so as to allow the said rib to pass over the wheel, and in cooling contracts and fits the rib into the groove so firmly as to hold the tire in its place without the use of bolts."

[*Printed, 6d. Drawing.*]

A.D. 1864, June 21.—No. 1550.

BOTTOMLEY, JOHN.—Construction of carriage bodies. "The object of the improvements is to give increased sitting room to carriages having internal back and front seats and glass fronts. For this purpose a portion of the carriage about the middle of the length of the interior front seat is, with the glazing thereto, recessed outwards, and a portion of the said seat is at that part set back into this recess between the side portions of the said seat, so that the occupier of the central portion of such front seat sits somewhat in the rear of those on either side of him, and the side seats are arranged so that their occupiers may either sit parallel or

“ inclined to each other. By these means three persons are  
 “ enabled to sit in a width of carriage or length of seat room  
 “ ordinarily occupied by two persons, and the external  
 “ appearance of the carriage is also improved.”

[*Printed, 6d. Drawing.*]

A.D. 1864, June 23.—No. 1582.

ADAMS, WALTER. — (*Provisional protection only.*)—Direction or course indicator. “ This invention has for its object improvements in apparatus for indicating to the drivers of  
 “ cabs and other carriages the course a passenger desires to  
 “ be driven.” “ The form of the indicating instruments may  
 “ be varied, but to a Hansom’s cab it is preferred that they  
 “ should be in forms of or attached to levers turning on axes  
 “ on the roof of a cab. Each instrument is connected to a  
 “ handle or pull in the interior of the carriage. The word  
 “ ‘stop’ may be written on one instrument, the words ‘turn  
 “ to the left’ on another instrument, and ‘turn to the right’  
 “ on another instrument; or the instrument may simply  
 “ indicate what the driver is to do by pointing in the direction,  
 “ or the instruments may have other indications thereon. In  
 “ like manner may like instruments be applied to the splash  
 “ board of other forms of cabs or carriages. Although it is  
 “ preferred that the instruments should be each in the form  
 “ of a lever, and turn on a fulcrum or axis, this is not essential,  
 “ as the instruments may be made to slide or move into and  
 “ out of position.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, June 23.—No. 1585.

TURNER, EDWARD RUSH, and TURNER, FREDERICK. — Traction and other portable engines. This invention “ is applicable to those classes of portable engines which have a  
 “ locking motion in front.” “ The improvements consist in  
 “ extending the upper plating of the steam boiler beyond the  
 “ fore end of the boiler. This projection at the end of the boiler  
 “ has applied to it the vertical shaft, by which the fore wheel  
 “ or wheels are caused to lock. Although the arrangement  
 “ for producing the locking motion of the fore wheel or wheels  
 “ may be varied, it is preferred that there should be a screw



“ wheel or part of a screw wheel fixed on the vertical shaft,  
“ and that to actuate the shaft a screw or worm should gear  
“ into this wheel. By thus extending the upper part of the  
“ plating of the boiler the fore or locking wheel or wheels may  
“ be of comparatively large diameter, and when the two are  
“ used they can be caused to lock under the extended upper  
“ part of the end of the boiler.”

[*Printed, 10d. Drawing.*]

A.D. 1864, June 27.—No. 1604.

ASKEW, JOHN.—(*Letters Patent void for want of Final Specification.*)—Go-carriage. This invention “ consists in the construction of go-carriages manufactured in iron, brass, steel, and other metal (that is to say), a rim formed of metal with three or more upright telescopic tubes, the bottom of each tube to be supplied with a spiral spring to give elasticity to the upper part of the carriage; these tubes are so arranged as to have adjustable set screws to regulate the height of the upper rim to receive the child’s or invalid’s body; each telescopic tube is supplied with joints at the top and bottom, which top is constructed with a door for the admission of the child or invalid, and provided with a safety lock and suspension belt for supporting the body of the child or invalid who may use the same, which carriage or rim is made moveable by castors made of brass or other metal with india-rubber rollers, which makes the same noiseless, and the least or slightest movement of the child or invalid gives the facility of going in any direction in which the child or invalid may desire to move; the same is to be constructed with joints and set screws, so that it can be taken to pieces for export and other compact purposes.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, June 27.—No. 1610.

STEEVENS, WILLIAM.—(*Provisional protection only.*)—Carts and waggons. The axle of a cart or the hind axle of a waggon is passed through the body and when springs are used they are placed inside; the weight is thus carried below the axle. The cart is balanced and the horse brought close to the axle, the front part of the cart extending over him. The shafts

pass through the body of the cart. The waggon body may be lengthened by iron slides. Water and liquid manure carts may be similarly constructed, also carts and waggon for any and similar services, the bodies, being of iron, serving as boats, shot proof sentry boxes, and hospital baths. The carts may be arranged also for cooking purposes.

To prevent horses running away when left without attendants, a wire cord or a strap attached to the bit is so arranged that upon a revolution of the wheels, it becomes tightened and so pulls the horse back on his haunches.

[*Printed, 4d. No Drawings.*]

A.D. 1864, July 11.—No. 1721.

GEDGE, WILLIAM EDWARD.—(*A communication from Pierre Varney-Morlet.*)

“This invention consists in an improved fore carriage moving on friction rollers or spheres, the advantage being the suppression of the greasing of the slide bars of the ordinary arrangement.” “For fore carriages with friction rollers a single drop of oil two or three times a year on each side the friction rollers suffices to avoid rust, but the fore carriage with spheres requires no greasing, it is fitted with two rings or wheel rails that above overlapping each side of that beneath, and guarding the slides or grooves for the spheres from any dirt. These arrangements of fore carriage may be adapted to any sort of vehicle even those for carrying heavy loads.”

[*Printed, 10d. Drawing.*]

A.D. 1864, July 12.—No. 1731.

DAY, SAINT JOHN VINCENT.—(*A communication from Andrew Lischine and James Handyside.*)—“Improvements in wheels and axle boxes for locomotive engines, carriages, and other vehicles used on railways, tramways, and common roads,”

According to this invention each wheel “consists of two central bosses of cast, wrought, or malleable iron or steel, or any other suitable material, forming the nave or central position of the wheel, and through the middle part of these bosses is bored the hole for receiving the axle,” the interior faces of the two bosses being either flat or curved, and kept at

such a distance apart as to hold between them two thin annular plates of iron, steel, or other suitable material. "The space between the plates increases gradually as the periphery of the wheel is approached, where the opening is of sufficient width to allow of the passage of the tyre between the two plates." The extremities of these two plates "are rounded off" so as to form an annular, curved, or other shaped ring all round the plate on its inner or outer sides, and the back portion of the tyre is made of a counter-part form, with a raised ring all round it, fitting into the annular space on the interior of the plates." The central bosses and plates are bolted or rivetted together, "the result being a light and exceedingly strong wheel," a space being left between the interior of the tyre and that portion of the two plates where their inner surfaces meet, which space it is preferred to fill up with either wood or sawdust, or other material that may be an imperfect conductor of sound, this effecting a great reduction in the noise usually made by wheels of this class.

According to the provisional specification another part of the invention consists in constructing the axle boxes of locomotive engines carriages and other vehicles "in such manner that a constant circulation water or other cooling liquid is maintained in their interior;" but in the final specification no allusion is made to any such arrangement.

[*Printed, 8d. Drawing.*]

A.D. 1864, July 13.—No. 1748.

KERRUISH, EDWARD. — (*Provisional protection only.*)—Collecting fares. "This invention relates to a novel construction of safety box for the collection of fares or tolls. The box is to be carried in the hand by the collector most generally, but may be conveniently made a fixture if desired, and when used at night a lamp can be affixed; it is provided with a funnel or opening, which is of sufficient size to permit the largest coin or ticket to pass through; the money or ticket placed in the funnel falls upon a rotating disc or drum, which whilst it is large enough to admit the largest coin or ticket yet will not allow the smallest piece to return through the aperture, the drum being provided with a ratchet wheel which allows it to turn in one direction only.

“ The box is further provided with a channel (the top and bottom  
“ of which are made of glass removable for cleaning) leading  
“ to an inner chamber or receptacle, which is securely locked  
“ or sealed if required, a piece of silvered plate glass being  
“ placed beneath the glass channel, so that the collector can  
“ see both sides of the coin or ticket. The box is held in the  
“ hand in an inclined position, and the money in its descent  
“ is arrested by a small trap or slide which closes the end of  
“ the channel, and retains the coin or ticket between the  
“ glass surfaces, the guard or collector is thereby enabled to  
“ inspect and count the coin or tickets collected, and if correct  
“ by removing the small trap or slide by pressing on a small  
“ button near the handle the coin or ticket will drop into the  
“ box or receptacle below.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, July 14.—No. 1762.

CARY, WILLIAM.—(*Provisional protection not allowed.*)—Making  
springs. “ The invention consists in the combination of  
“ shearing, punching, slotting, and nibbing apparatus to form  
“ one machine or tool, all of which are of the ordinary con-  
“ struction as now used separately ; but in order to economize  
“ space and time I combine them together, and so arrange  
“ them that they are driven by one shaft, on which are cams  
“ or eccentrics for moving the cutting, punching, slotting,  
“ and nibbing tools. The sheet of steel is first cut into the  
“ required width and length by the shears actuated by a cam,  
“ it is then placed beneath the descending punch or cutter,  
“ which punches or slots the necessary holes ; the plate has  
“ now to be indented or “ nibbed,” which forms elevations or  
“ depressions in each plate, by which means they are retained  
“ in position ; these indentations are formed by suitably  
“ shaped tools descending in vertical slides and acting on the  
“ plate. The tapering of the ends of the plates is effected by  
“ passing them between a pair of eccentric rollers on the cam  
“ shaft, which press unevenly and so taper the two ends and  
“ leave the centre portion thicker, in which state they are  
“ ready for securing together by hand to form the ‘plate  
“ spring.’”

[*Printed, 6d. Drawing.*]

A.D. 1864, July 29.—No. 1893.

LONG, JAMES,—(*Provisional protection only.*)—Brakes. “A steel spring, grip, or brake is applied to each wheel of any locomotive, tender, carriage, or truck, as for instance, round a flange or disc, cast, bolted or otherwise secured to the inside of the wheel. One end of this steel spring, grip, or brake is fixed to the framework or body of the locomotive, tender carriage, or truck; it then passes round the said flange or disc on the wheel, and its other end is fixed to the buffer rod, which passes from end to end of the locomotive, tender, carriage, or truck, and works through guides or bearings. The buffer rods may be connected together by a cross bar (if thought desirable) so as to ensure their more uniform action. Now when any diminution takes place in the speed, or the locomotive is reversed, pressure is immediately brought upon the buffers. Any pressure on the buffers at either end moves more or less the springs attached thereto, which act proportionately on each and every pair of wheels nearest thereto, thus forming a powerful skid or brake, and tending to bring the train to a stop more or less quickly as may be desired. When the pressure is removed from the buffers the springs tend to spring the buffer rods back to their normal position and so free the wheels from the grip or brake action of the said springs.

“A similar arrangement is applicable to omnibuses and other road carriages. Also by a handle or lever gearing the railway guard, omnibus conductor, or other attendant can put a stop into action and prevent the grips or brakes operating on the wheels when necessary, and by these or similar means the grips or brakes can at any time be put in or out of action.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, August 9.—No. 1978.

PAYNE, MARK.—Traction engine.—The power is transmitted to the traction wheels through a gear wheel of peculiar construction, that receives motion from a spur pinion attached to or cast with a chain wheel, which is actuated by an endless chain from a pinion on the crank shaft of the engine. This gear wheel is composed of two rings bolted

“ together with transverse rounds, into which the driving  
“ pinion gears as into spur teeth, and thus any dirt taken up  
“ by the wheel will work out by the action of the pinion.  
“ The rings are bolted to forked arms radiating from the boss  
“ of the wheel. The advantage of this construction of wheel  
“ is, that when a round is broken it can be readily replaced  
“ while the engine is on the road. The axle of the driving  
“ pinion runs under the boiler, and carries a capstan for the  
“ purpose of hauling the engine out of any slough into which  
“ it may happen to run by the aid of a chain and anchor.  
“ The axle is carried by slotted brackets, and is capable of  
“ being shifted in order to throw the pinion in and out of  
“ gear. When out of gear with the wheel before mentioned  
“ this pinion may be made to drive the hauling tackle or  
“ windlass used in steam cultivation. The cylinder or cylin-  
“ ders can be mounted either above or below the boiler  
“ and within the smoke box. For the purpose of reducing  
“ friction, and to simplify the construction of the engine,”  
the patentee makes “ the cross head work on one fixed guide  
“ (instead of a pair, as heretofore) which guide is carried by  
“ the cylinder cover, and is further supported by a bracket on  
“ the shell of the boiler. This cross head is made in two  
“ parts to allow of easy access to the brasses of the fixed  
“ guide.”

[*Printed, 10d. Drawing.*]


A.D. 1864, August 10.—No. 1985.

GRICE, JOHN, the younger.—Folding steps.—These folding steps are thus constructed:—“ A vertical plate fixed on the  
“ under side of the bottom of the carriage and underneath the  
“ door has a plate hinged or jointed to the bars on its sides,  
“ the said jointed plate when turned upon its joint into a  
“ horizontal plane constituting the top step; the said bars  
“ are commonly called the main sides of the step. To the  
“ free end of the said top step vertical bars are jointed, which  
“ carry at their lower ends two other bars on which is fixed  
“ another plate, this last described plate constituting when  
“ brought into a horizontal plane the bottom step. The two  
“ steps and the vertical bars connecting them are capable of  
“ folding up into a vertical plane against the first described  
“ vertical plate. The mechanism by which the folding is

“ effected is constructed as follows :—Underneath the top step, and at about one-third the distance between it and the bottom step, are two horizontal bars parallel with the top step, each bar being jointed at one end to the bottom of the bar or main sides of the first described plate, and at the other end of the vertical bars which connect the top and bottom steps. At the back of the vertical bars connecting the steps together are two other vertical parallel bars jointed at top to the horizontal bars and at bottom to the heel of the bottom step. A connecting rod is fixed to one of the inner vertical bars, and passes in an oblique direction through the first described vertical plate, and its top end is jointed to a slide working in a dovetail underneath the carriage. As the door of the carriage is opened and closed the said slide is operated upon by the door. On the closing of the door the connecting rod is made to draw in the vertical inner bar to which it is connected, by which motion the steps are folded up against the vertical plate. On the opening of the door the connecting rod pushes out the vertical bar, and thereby unfolds the steps; the extent to which the steps can unfold is limited by stops of the ordinary kind. By dispensing with the oblique connecting rod which connects the steps with the carriage door, the steps may be folded and unfolded by hand.” “Instead of fixing on the upper surface of the steps the ribs on which the step joints are made” the patentee fixes the said ribs on the under side of the steps, the ends on which the joint is formed passing through holes to the upper side of the steps. By this arrangement great breadth of step is obtained without any projection on its surface. The last described improvement is applicable to the folding carriage steps in general.”

[*Printed, 1s. Drawings.*]

A.D. 1864, August 18.—No. 2054.

SWIFT, FERDINANDO. —(*Provisional protection only.*)—Axles and axle boxes. These improvements relate to an invention for which Letters Patent were granted to the present inventor in 1856, No. 2. The inventor says, “I form a frame extending across the under side of the carriage, of in section an inverted , circular, or other convenient shape. At or

“ about the centre of this frame, and midway between the  
 “ wheels, I place an axle box constructed as hereafter de-  
 “ scribed. Each wheel has its separate and distinct axle,  
 “ which I prefer to make somewhat conical or tapering, that  
 “ is, smaller near the centre than at the wheel end. Each  
 “ axle is supported and is free to revolve in the box before-  
 “ mentioned, and the outer ends pass through brasses or  
 “ bearings, outside which the wheels are keyed; or the spokes  
 “ of the wheel are inserted in lumps formed on the end of  
 “ the axles. Hence it will be seen that each wheel revolves  
 “ with its axle, which being supported at both ends, as before  
 “ described, renders the motion of each wheel steady without  
 “ the possibility of any shaking, or the wheel becoming loose.  
 “ When the axles, constructed as before described, are  
 “ applied to railway carriages, the axles traverse a tubular  
 “ frame, and each wheel being fitted to a separate and distinct  
 “ axle great facility is afforded for passing round curves.  
 “ The central axle box is formed in two parts with two sockets  
 “ or receptacles to receive an enlarged portion or lump  
 “ formed on the inner end of each of the axles. To insert  
 “ the axles in the box one half of the box is removed, and the  
 “ enlarged portion of the axles are laid in the receptacles  
 “ formed therein, the second half of the box is then laid on  
 “ the first, and over the axles, and a plate is laid on it, and  
 “ secured to the frame by nuts. The nuts are prevented  
 “ from moving by a second plate inserted between the nuts,  
 “ and which it partially embraces, the second plate being  
 “ secured to the first by screws. The plate, which partially  
 “ embraces the nuts after being removed, acts as a key for  
 “ removing the nuts. Plates similar to those just described  
 “ are also employed for securing the outer boxes of the axles.  
 “ Lubricating apertures or receptacles are provided in the  
 “ frame over the axle boxes, the said apertures or receptacles  
 “ being closed by slides, or otherwise, after the oil or other  
 “ lubricating material has been introduced.”

*[Printed, 4d. No Drawings.]*

A.D. 1864, August 26.—No. 2112.

MARSHALL, RICHARD. — Carriage windows. “The frame  
 “ of a window of a carriage is near its upper end provided  
 “ with two spring catches or bolts, one at each side. The



“ catches or bolts are formed at the outer ends of two rods  
“ which pass through holes formed in the top rail of the  
“ window, and the rods are acted on by a knob or handle in  
“ the following manner:—On the stem of the knob or handle  
“ is a cam which acts on two short levers which are in con-  
“ nection with the rods; these levers are constantly pressed  
“ on by springs in such manner as to force out the catches  
“ or bolts, and when the springs are free to act on the two  
“ levers the two bolts or catches will be caused to project  
“ beyond the two side rails of the window and enter recesses  
“ or ratchets formed in the inner sides of the carriage door  
“ or frame wherein the window slides. The cam and the  
“ levers are recessed in the upper rail of the frame of the  
“ window, and they are covered over by a suitable plate.  
“ The window is raised by means of the knob or handle, and  
“ the window will be retained in the position desired by the  
“ two bolts or catches. When it is desired to lower the  
“ window the bolts or catches by a partial rotation of the  
“ handle will be withdrawn and the window will be free to  
“ be slid down. At the lower part of the window of a car-  
“ riage I also place two springs one on each side, which  
“ when the window is fully raised tend to press the lower  
“ rail of the window inwards. A projecting lip is also formed  
“ on the lower edge of the window, and a similar projecting  
“ lip on the door or other frame in which the window slides.  
“ When the window has been fully raised the lip on the lower  
“ edge of the window is by forcing out the lower part of the  
“ window moved beyond the lip on the frame, and then when  
“ the window has been lowered a short distance the springs  
“ at the side of the window will force the lip on the lower  
“ edge of the window inwards against the lip on the frame,  
“ and thus a trap will be formed which will shut out rain.  
“ These springs also press the bottom of the window inwards,  
“ so as to clear the lip on the frame when the window is  
“ slightly raised in order that it may be again lowered.”

[*Printed, 10d. Drawing.*]

A.D. 1864, September 1.—No. 2148.

CLARK, WILLIAM.—(*A communication from Alfred Dorlhac.*)  
—(*Provisional protection only.*)—Tune register for carriages.  
A dial or strip of paper is kept in continuous motion by a

clock. A pencil traces a line on the dial or strip at all times, the position of the line varying as the carriage is occupied or not. The pressure of the occupant upon the seat or floor moves the pencil into a different position, and when the vehicle next becomes disengaged, the driver, by means of a handle near him, restores the pencil to its normal position. A bell indicates each change of position.

[*Printed, 6d. Drawing.*]

A.D. 1864, September 2.—No. 2155.

STUBBER, NICHOLAS.—(*Provisional protection only.*)—Propelling vehicles. The inventor says, “by these improvements I “ obtain from the use of a metallic or other screw, power to “ propel all description of land carriages, and increase the “ effective power of all description of motive-power engines “ and machinery.

“ The first part of my invention consists of a metallic or “ other screw attached to the body, axle, or shaft of the carriage or machinery to be propelled or driven. This screw “ is set and worked horizontally or vertically in a suitable “ frame, or attached by other suitable means to the carriage. “ This screw is then connected at one end with the shafts or “ wheels of the carriage, conveyance, or engine to be propelled by cog or bevel wheels, endless screw, or worm and “ wheel, and the other end of the driving screw is connected “ with the second or other shaft of the carriage, engine, or “ machinery by means of an endless screw or by a cog wheel “ or pinion or endless screw and wheel, by which power of “ the connecting or driving screw is imparted to the axle or “ other part of the carriage, to be propelled. The cog or “ other wheel used to drive the main or driving screw may be “ placed on the axle of the carriage to be propelled.”

[*Printed, 1s. Drawings.*]

A.D. 1864, September 14.—No. 2239.

GLOVER, BENJAMIN. — Carriage wheels and axles. This invention relates to a method of securing wheels on their axles. “For this purpose” says the patentee “I prefer to “ form the boss of the wheel of cast metal, although I do not “ confine myself thereto, as it may be of wood or other suit-

“ able material if desired. The inner side of the boss of the  
“ wheel is formed with a recess to receive a fixed circular  
“ collar formed upon the axle (as is well understood). The  
“ end of the axle passes through the bore in the centre of  
“ the boss into a circular recess formed in the outer side  
“ thereof. The axle near the end has a groove formed around  
“ it, and from this groove to the extreme end of the axle two  
“ or other number of grooves or keyways are cut three being  
“ the number of grooves I prefer to employ. In order to  
“ secure the wheel upon the end of the axle so formed a  
“ ring or ‘collet’ larger in diameter than the axle, is slid  
“ thereon having a central opening corresponding in form  
“ with the end of the axle, so that it will readily fit and slide  
“ thereon until it reaches the circular groove previously de-  
“ scribed, when it will be free to revolve, so as to bring the  
“ central projections formed on the inner circumference of  
“ the ‘collet’ behind the projections upon the end of the  
“ axle, and the enlarged openings opposite the grooves or  
“ keyways upon the end of the axle. A locking plate or cap,  
“ having projections thereon which correspond in form and  
“ number with the grooves or keyways cut on the axle and  
“ collet, is then slid into the grooves, so as to pass along  
“ into the ‘collet’ and thus act as a key or locking instru-  
“ ment to fix and secure the ‘collet’ to the axle, a small  
“ screw pin or key being introduced through the parts to  
“ prevent their movement. By this means the wheel will  
“ be retained securely upon the end of the axle. The end of  
“ the axle is covered by a cap, which is screwed into a recess  
“ formed on the outer side of the boss of the wheel, and  
“ oil for lubricating the axle is conducted into this screw  
“ cap through a suitable orifice formed for that purpose.”

[*Printed, 8d. Drawing.*]

A.D. 1864, September 14.—No. 2240.

SKELDON, PETER.—(*Provisional protection only.*)—Anti-fric-  
tion bearings. The inventor says:—“ I take twelve or other  
“ number of rollers of a length nearly equal to that of the  
“ gudgeon or neck of the shaft or axle, and I mount the said  
“ rollers in a circular frame of a little larger diameter than  
“ the neck of the shaft or axle. I make the said circular  
“ frame by preference of two semi-circular parts hinged to-

“ gether. I fit the frame of rollers in the bearings or on the  
 “ end of the shaft or axle, the said rollers occupying the  
 “ space between the said bearings and the shaft or axle. As  
 “ the shaft or axle turns, the rollers are put in motion and  
 “ travel in the direction in which the shaft or axle rotates.  
 “ The only rubbing surfaces in a bearing constructed accord-  
 “ ing to my invention are the ends of the rollers in the cir-  
 “ cular frame, and as these surfaces are not subjected to any  
 “ pressure excepting their own weight the friction between  
 “ them is very small.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, September 17.—No. 2283.

RICHARDS, RICHARD.—Axles and axleboxes. “The object  
 “ of the first part of this invention” says the patentee “is  
 “ to secure the bush upon the axle in a simpler manner than  
 “ formerly. Hitherto a right and left handed screw and a  
 “ collet has been used, but I propose instead thereof to  
 “ employ a single button. I also tighten the bush as the  
 “ leather washer in the collar wears away by means of a  
 “ slot with which the button is fitted, and through which slot  
 “ a linch pin is projected when the bush is adjusted to its  
 “ proper tightness.

“The second part of my invention has for its object to make  
 “ the collar of a reduced size, which I do by altogether dis-  
 “ pensing with the usual inner flange, and instead thereof I  
 “ provide a perfectly flat bearing for the axle.

“The third part of my invention relates to the lubrication  
 “ of the axle.” “An aperture is constructed in that part of  
 “ the bush which is at the back of the wheel, and this being  
 “ the highest point of the axle, the oil by its own gravity runs  
 “ down into the cap and parts where it is required.”

[*Printed, 8d. Drawing.*]

A.D. 1864, September 19.—No. 2295.

SIEVIER, ROBERT WILLIAM.—“Improvements in wheels and  
 “ arranging them on their axles or shafts.”

This invention consists firstly, “in causing the wheels of  
 “ locomotive engines, carriages, or waggons to be elastic (if  
 “ such a term may be used) by enabling the wheel itself to

“ lay down an elastic or spring railway as it travels along  
“ the ordinary railway, by which means the wear and tear of  
“ two rigid bodies is in a great measure prevented, and also  
“ the shocks caused by the unevenness of the line greatly  
“ reduced.”

A mode of carrying out the invention is described, in which the ordinary driving wheel of a locomotive engine has fixed upon its exterior circumference, blocks of wood or metal, one block being directly opposite the end of each spoke, and there being placed around these blocks a flat steel ring. On the outer part of this ring are also placed wooden or metal blocks, these coming between the parts opposite the ends of the spokes, the steel ring being kept in its place by pins or otherwise, and the tire of the wheel being placed upon the last named blocks, such tire being by preference of steel. “ This tyre being entirely free to expand and contract, would  
“ not be liable to break, as is the case at present.” If preferred, the blocks between the tire and the steel ring may be attached to the tire, and the ring may be loose, but in that case the tire must be kept in its place by suitable means. The patentee states that he should prefer a driving wheel thus constructed to be without a flange, the other flanged wheels keeping the engine on the rails, or a tire might be fastened on one side of the periphery of the wheel, and the other side have a piece of less width. When these elastic wheels are placed on the locomotive engine, or ordinary railway carriages, one is, by preference, a loose wheel, but if applied to vehicles for ordinary roads both wheels may be loose on the axle.

Another part of the invention consists in a mode of arranging the wheels of locomotive engines, carriages and waggons so that one wheel shall be loose and the other fast upon the axle, the wheels thus being capable of travelling at different speeds when passing round curves in rails, the loose wheel having a groove in the interior of the eye or nave for the reception of lubricating material which may be introduced thereto by means of a hole leading to the outside of the nave and fitted with a screw plug.

[*Printed, 8d. Drawing.*]

A.D. 1864, September 22.—No. 2321.

HOFMANN, JULES ROBERT.—(*Provisional protection only*).—Releasing runaway horses. The following is the provisional specification:—"My invention consists in a set of double  
" rings or snugs, with bolts and springs proper to be applied  
" to all sorts of harness, carriages, carts, and vans, by  
" means of which the horses can be instantly released from  
" the vehicle in case of danger. To attain that object I use  
" instead of the roller bolts or hooks ordinarily fixed on the  
" splint bar of the carriage, a series of double rings or snugs,  
" between which the loops of the traces are fastened by bolts,  
" of which the driver has full command by means of a strap  
" or chain to remove instantly, thus releasing the horses from  
" the vehicle when required. I use the same system of  
" double rings or snugs to the end of the pole of the carriage,  
" where they are kept in their proper place by a spring,  
" which the pressure of the rings or snugs, when the horses  
" go forward, disengages."

[*Printed, 4d. No Drawings.*]

A.D. 1864, September 30.—No. 2415.

CLARK, WILLIAM.—(*A communication from Constant Jouffroy Duméry.*)—"Improvements in vehicles."

The object of this invention, as regards railway carriages, is "to dispense with the connection between the wheels  
" without losing the advantage of journals and fixed bearings," and to "diminish the amount of friction on each of  
" the journals or pivots by doubling their number" while for ordinary vehicles journals turning in fixed bearings are substituted for boxes rotating on fixed journals; in both kinds of vehicles "the lateral play caused by the angular motion of  
" the axle" being obviated or lessened; large wheels are applied to low vehicles; and each fore wheel is pivoted upon an independent vertical axis, "so as to admit of the vehicle  
" being turned without displacing the centres of support of  
" the fore wheels." In order to obtain these results a kind of "elastic parallelogram" is formed "which is composed of  
" two, three, or four springs, and connected near its centre  
" to a rigid fork forming the bearing, and transmitting a  
" uniform and simultaneous deflection from the several parts

“ of the elastic parallelogram. The plates of the springs  
 “ composing said parallelogram are fixed or rather jointed at  
 “ their ends to the fixed parts of the body, and as their elas-  
 “ ticity can only be utilized in one direction, while laterally  
 “ and longitudinally they are completely inflexible, the wheels  
 “ and body of the vehicle can only move vertically.”

The invention is described under a great variety of modifications, the advantages of the arrangements set forth over those ordinarily adopted for supporting and suspending vehicles both for railways and ordinary roads, being pointed out.

[*Printed, 1s. Drawings.*]

A.D. 1864, October 1.—No. 2425.

BEAUMONT, WILLIAM HENRY. — (*Provisional protection not allowed.*)—“ An improved sack holder and a combined sack  
 “ holder and cart or truck combined.”

The applicant says, “ The first part of my invention relates  
 “ to the mode of arranging the inner bar of the sack holder,  
 “ which is brought up so as to clasp the sack, acting inde-  
 “ pendently on the cross bar, and in place of side spring  
 “ handles a spring clip is used at the top to clip the two bars  
 “ together. A chain is employed in place of a bar to connect  
 “ the front and hind legs together.

“ The second part of my invention consists in arranging the  
 “ improved sack holder above described in combination with  
 “ a sack, cart, or truck. In carrying out this part of my  
 “ invention the sack holder is mounted upon an ordinary sack  
 “ truck, from which it can be readily separated by removing  
 “ two pins or bolts or other simple fastening by which it is  
 “ secured to the truck.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, October 11.—No. 2498.

JONES, BEAUMONT HILL. — “ Appliances or arrangements  
 “ applicable to the feet or legs for facilitating locomotion.”

These appliances, which are really little carriages to be attached to the feet, are thus described :—“ I have a sole piece,  
 “ the same to be constructed of thin iron, wood, strong  
 “ leather, or other suitable material, and shaped so that a

“ boot or shoe will fit comfortably on it. To the outside of  
“ this said sole-piece I attach by screws, nails, rivets, or other  
“ suitable fastening a frame, the same to be made of iron,  
“ wood, strong leather, or other equivalent material, and  
“ extending sufficiently high to give support to the leg,  
“ and I also propose that this said frame should be made  
“ rather wider near the top to permit of freedom in the action  
“ of the leg, and it may also turn round slightly so as to  
“ retain a hold on the leg. It may also be furnished with a  
“ strap and buckle or other equivalent fastening, so as to keep  
“ it closely fitting to the outside of the leg. This frame may  
“ be jointed near the ankle to accommodate the leg to the  
“ backward and forward action; or it may be made in a  
“ piece with the sole piece. Attached to this aforesaid  
“ framing at such a height that the foot will be raised off the  
“ ground, so as to pass over small stones and inequalities of  
“ the road, I have two or more wheels placed at any con-  
“ venient distances along the outside of the foot, and they  
“ may be made of any convenient diameter, and arranged so  
“ as to work independently of each other. These wheels  
“ may have their rims grooved for the purpose of receiving  
“ a band of india-rubber, or other suitable elastic material,  
“ which gives a greater hold on the road and runs with less  
“ noise; or they may be made without the indian-rubber or  
“ elastic material, which may then be placed in the tread or  
“ at any convenient part of the sole, so as to give the necessary  
“ elasticity to the foot. Over the fore part of the foot or  
“ instep a laced band or other apparatus may be inserted to  
“ give additional hold and support to the foot, and the afore-  
“ said iron frame may be continued round the heel to prevent  
“ the foot from moving. I also insert a stop underneath  
“ the heel to act as a brake, when it is desired to stop.”

[Printed, 10d. Drawing.]

A.D. 1864, October 13.—No. 2527.

HENRY, MICHAEL.—(*A communication from the Société E. Gellerat and Cie.*)—Steam road rollers and traction engines.  
“ The invention relates to steam machinery for rolling roads  
“ and ways, and also to other engines, carriages, and apparatus  
“ propelled by steam on common roads.” “The wheels or  
“ rollers on which the improved machinery or apparatus



“ travels and is supported, and which when worked by the  
“ steam engine propel it in either direction, will also be made  
“ to steer or turn it to either side by moving their axles out  
“ of the parallel, and causing them to converge at the ends.  
“ For moving the ends of the axles for that purpose the axles  
“ instead of being fixtures are suspended to the frame by  
“ brackets with friction rollers, and are moved by a double-  
“ threaded worm or screw, which is attached to the frame  
“ and takes at the ends into nuts on the axles, and is worked  
“ by handles, and bevil gear and otherwise. For communi-  
“ cating motion to the rollers or wheels a connecting rod or  
“ crank arm is jointed at one end to a radial arm of the last  
“ toothed wheel driven by the engine, and at the other to a  
“ radial arm or spoke of the roller or bearing wheel; the  
“ toothed wheel is on the axle box, so that motion may be  
“ transmitted to and from it, notwithstanding the variation  
“ of position of the axles. Band or pitch chains are used for  
“ driving this toothed wheel. For varying the speed of the  
“ horizontal shafts without altering that of the engine, a  
“ cranked axis worked by the engine transmits motion to the  
“ shafts by two sets of gearing of different size or number of  
“ teeth, so that the velocity will be varied according as to  
“ which set is in gear. Springs are used between the axle  
“ and frame of the carriages, either between the axle and the  
“ ‘longeron’ (longitudinal frame bar), or outside above or  
“ below it.

“ The axle boxes are preferably oval and are supported  
“ laterally and guided in their up and down play by the  
“ guards, so that the toothed wheel on the axle box may  
“ always maintain its position with regard to the roller or  
“ wheels, as if there were no springs.”

“ The guards may be attached to the axle box or to the  
“ ‘longeron’ which may be supported at one end by springs  
“ resting on the axle box and provided with friction rollers.

“ When the improvements are applied to traction or portable  
“ engines, the axles of the bearing or propelling wheels are  
“ driven from the centre, and are turned thereon by the  
“ following arrangement:—On the axle box of each axle is a  
“ frame, on which is a hoop or ring, into which fits another  
“ hoop or ring connected with the general framework. These  
“ rings may be in direct contact with each other, or friction

“ rollers may be interposed between them, so that each axle  
 “ will work like the fore axle of ordinary four-wheeled car-  
 “ riages, except that two rings are used instead of a pole, pin,  
 “ and socket, and the arrangements whereby motion is trans-  
 “ mitted from the engine may be placed within the rings.”

“ The axles are caused to converge or moved out of the  
 “ parallel by a pair of horizontal levers fixed to the rings,  
 “ supported by the framing connected with the axles; the  
 “ free ends of these levers are brought nearer to or farther  
 “ from each other, and may for that purpose be worked both  
 “ at the same time by a horizontal transverse screw carrying  
 “ a nut, to which the ends of the levers are connected by  
 “ stays, or a pair of transverse screws may be used instead of  
 “ a single one, so that each lever (and therefore each axle)  
 “ may be worked or caused to converge separately instead of  
 “ both levers together.”

[*Printed, 8d. Drawing.*]

A.D. 1864, October 18.—No. 2572.

MACDONALD, JOHN.—(*Provisional protection only.*)—Carriage bodies. This invention relates to the construction of carriages or of parts of carriages of sheet iron, metallicallly coated or not. The inventor says, “I cut and fashion plates or sheets of iron of the required size and form, and I combine or join them together by folding their edges in the manner commonly called seaming. The hinges of the doors and such parts as cannot be joined by the process of seaming I connect or join by rivetting, screwing, or soldering. The carriage is painted externally, and lined internally in the ordinary manner, excepting that the lining is attached to strips of wood rivetted to the metal, or is attached to the metal by marine glue or other adhesive composition. I make the under work of the carriage in the ordinary way, and I attach the body of the carriage to the said under work by screwing, soldering, or rivetting.

“In order to lessen the vibration of the carriage when in motion, I prefer to isolate the body from the under work by means of vulcanized india-rubber, or other bad conductor of sound.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, October 20.—No. 2597.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Alfred Claustre.*)—(*Provisional protection only.*)—Indicator for vehicles. This apparatus is intended to register the distances travelled, both when occupied and unoccupied, as well as the time the vehicle remains at rest, distinguishing the time the vehicle is engaged from that when it is disengaged.

A sheet of chemically prepared paper is caused to move evenly by clockwork. This paper receives the record. The apparatus for registering the distance travelled is worked by an electro-magnetic current produced by the revolution of the wheels. This apparatus causes the movement in an upward direction of a chain carrying a metallic style and a pencil. Thus if the vehicle be in motion a curved line will be traced on the paper, to be followed by a straight horizontal line as soon as the carriage stops. When a passenger enters, the seat causes an electric current to pass through the above-mentioned style. This current colours the paper in its track and thus the correspondence of plain and coloured lines shows the vehicle to have been occupied. The coachman has the means of restoring the seat to its normal position. There is also a dial upon which the distances travelled are shown. This part of the apparatus is worked from the wheel axle.

[*Printed, 4d. No Drawings.*]

A.D. 1864, October 27.—No. 2662.

CRAVEN, JOHN, and FOX, SAMSON.—(*Provisional protection only.*)—"Improvements in railway rolling stock and agricultural and traction engines."

These improvements relate to an arrangement of radial axles for facilitating passage of curves. "Each wheel is fixed upon a separate axle, and the inner ends of the two axles to each pair of wheels are supported in moveable bearings carried in each end of a connecting link, or the two arms of a lever placed intermediate betwixt the two wheels, and hinged in the middle on a stud fixed to the framing of the engine or carriage, so as to be capable of swivelling thereon. The outer ends of the axles are supported in the usual kind of axle boxes, which are formed and arranged so as to allow oscillation of the axles. The lever bearings of one pair of axles may be connected diagonally by a rod to the lever

“ bearings of the next pair of axles. By these improvements  
 “ the wheels are capable of self-adjustment to any curve (or  
 “ to straight lines) of rails, as the axles are always brought  
 “ into radial lines with the centre of the curves. The wheels  
 “ being thus self-adjusting to the rails, there is no tendency  
 “ to run off the rails, and thereby friction and wear and tear  
 “ are avoided. Agricultural and traction engines may be  
 “ turned or moved in very sharp curves, by the application of  
 “ these improvements, to any ordinary steering apparatus.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, October 29.—No. 2680.

DURANT, ANGUISH HONOUR AUGUSTUS, and GORE, WILLIAM HENRY POSTLETHWAITE.—(*Provisional protection only.*)—Materials for carriage building. This invention “applies to the  
 “ manufacture of a material or combination of materials to  
 “ be used in the construction of panels to be employed as  
 “ substitutes for wood or other materials in building, or for  
 “ carriage panels, or for any other constructive purpose where  
 “ strength and lightness combined are desirable.

“ The invention consists, firstly, in the combination of metal  
 “ with papier maché by means of paste, glue, white lead, or  
 “ such other cement or adhesive material as will cause the  
 “ sheets of papier maché to adhere to the metal. The metal  
 “ may be either in plain sheets or perforated, corrugated, or  
 “ otherwise roughened, so as to cause the materials to adhere,  
 “ or it may be used in the form of strips, plaited or otherwise,  
 “ or of wire woven or netted together.

“ Another part of the invention consists in combining tow,  
 “ hemp, or other uncut fibrous material, or strips of fibrous  
 “ woven fabric, with papier maché or paper pulp during the  
 “ process of manufacture, such tow or other fibrous material  
 “ being previously steeped in a suitable adhesive material or  
 “ mixture to cause it to be more thoroughly incorporated with  
 “ the papier maché or paper pulp, the object being to give to  
 “ the said papier maché or pulp an increased toughness with-  
 “ out increasing the weight.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 1.—No. 2698.

GEDGE, WILLIAM EDWARD.—(*A communication from Jean Baptiste Legault.*)—(*Provisional protection only.*)—“An improved axle.”

The inventor proposes in this case to place "on that part of an axle subject to wear," and on each side thereof, a nut or convex projection in the form of a wheel about three parts of an inch in thickness or breadth, there being on the outer periphery of this height, and an inch or two inches in convex projection, "the half of a concavity absolutely of the same dimensions in its interior as the projection," this being fixed firmly by its two ends to a second axle connected with the springs or the side framing of the carriage, the lower half of the projection on the moveable axle being placed on the other half of the concavity. The inventor states that by this means he diminishes, by at least a third, the length of the rubbing surface of the axle in the axle box, and fixes in the most secure manner the carriage to the moveable axle without danger from lateral or other shocks. To facilitate the lubrication of this moveable axle, there is made on or in the upper concave part a small opening communicating with the upper convex part, in such manner that the lubrication is easily effected.

The arrangements mentioned above are set forth as being "peculiarly applicable to carriages when the roads are straight or slightly curved," the system being rendered applicable to "all roads whatever," by an arrangement which permits the wheel on the inside of the curve to "unscrew" itself from the axle, "and either to remain still, or better to turn slowly while the opposite wheel advances," resuming its course when the curve has been passed, "the screwing and unscrewing taking place without mechanical assistance."

This improved axle "may be applied to railway vehicles as well as to those running on ordinary roads."

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 1.—No. 2701.

RICE, WILLIAMS.—Applying wheels and axles. "This invention has for its object improvements in applying the wheels and axles of railway and other carriages.

"Heretofore it has been generally the practice to fix or key the wheels of railway carriages to the axles, so that the wheels and axles revolve together, but in some cases the wheels of such carriages have been arranged to turn on their axles, whilst the axles are fixed or retained from rotating.

“ Now, according to ” this “ invention, the wheels are not  
 “ only free to turn on their axles, but the axles themselves  
 “ are free to turn also. The ends of the axles as heretofore  
 “ are received into bearings such as are now employed, and  
 “ are lubricated as heretofore, and the centres of the bosses or  
 “ naves of the wheels are suitably formed to turn freely on  
 “ the axles, they not being keyed thereon. The parts of the  
 “ axles on which the wheels are received and the interior of  
 “ the naves are, as is well understood, prepared and fitted  
 “ accordingly, and they are lubricated either from the same  
 “ boxes as the other parts of the axles, or separate provision  
 “ is made for lubricating those parts. In like manner the  
 “ wheels and axles of other carriages may both be made free  
 “ to turn.”

[*Printed, 10d. Drawing.*]

A D. 1864, November 2.—No. 2713.

WALKER, JOHN.—(*Provisional protection not allowed.*)—Sig-  
 nalling in carriages. The following is the applicant's pro-  
 visional specification :—

“ My invention consists in placing fan blades, either verti-  
 “ cally or horizontally, on the top or side of railway or other  
 “ carriages, which compress the air into a narrow tube, in the  
 “ mouth of which a whistle is fitted, when the blades are  
 “ allowed to rotate, and in fitting a stop or detent to prevent  
 “ the rotation of the blades, which stop is capable of being  
 “ withdrawn by a cord, rod, chain, or spring, from the inside  
 “ of the carriage when a signal is to be made. On the detent  
 “ being withdrawn the rotation of the fan, consequent upon  
 “ the passage of the carriage through the air compresses the  
 “ air into the narrow tube, and sounds the whistle as long as  
 “ the fan is allowed to rotate.

“ In some cases I dispense with a fan and use a box or case  
 “ with an entrance aperture fitted with a valve and exit aper-  
 “ ture, to which a whistle is fitted either directly or through  
 “ a tube; I then connect the valve with a pall inside the car-  
 “ riage, so that on its being withdrawn the whistle will be  
 “ sounded.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 3.—No. 2721.

NEWBOULD, WILLIAM.—(*Provisional protection only.*)—Checking receipts of fares. “ The person in charge of a vehicle  
“ plying for hire has delivered to him by the proprietor of the  
“ said vehicle a number of tickets, cards, tokens, or medals,  
“ with any suitable printing or device thereon. Each of  
“ these, called checks, represents a certain value, and has to  
“ be accounted for. When a passenger is in or on the vehicle,  
“ say, when he enters, pays his fare, or leaves, he has delivered  
“ to him by or he receives from the conductor, guard, or  
“ driver in charge one of the above-mentioned checks, this he  
“ places in the apparatus herein-after described provided to  
“ receive the same.

“ At the entrance door on the top, or at such part or parts  
“ of a vehicle as may be convenient to a person’s hand, there  
“ is or are one or more slits or openings to receive the checks.  
“ The said slits or openings are formed in or on flat pipes or  
“ passages which lead to a closed box or several boxes of metal  
“ or other material, each with one or more compartments  
“ therein, say, two, to receive inside and outside passengers’  
“ checks, the key or keys of the box or boxes being in the  
“ possession of the proprietor. At night lamps could be placed  
“ close to the slits or openings.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 3.—No. 2727.

BRANT, JOHN CHARLES.—(*Provisional protection not allowed.*)—Lighting carriages, &c. The applicant says “ I attach to the roof  
“ of railway carriages and other conveyances or floor of build-  
“ ings a case or tube constructed with reflectors so placed in  
“ any way I may deem fit to carry out the nature of my in-  
“ vention. In the centre of the case or tube or at the ends I  
“ place a lamp to burn oil or any other illuminating fluid or  
“ gas, with a reflector or reflectors. In the roof of the car-  
“ riage, and over each compartment, I have an opening in  
“ which I insert a piece of ground or tinted glass, and in the  
“ case or tubes illuminated in the roof of the carriage over  
“ the glass I place a reflector; by this means I throw the  
“ light into every compartment of the carriage, or where re-  
“ quired. When gas is employed, I prefer to place an iron

“ tube or gas holder under the carriage. I insert in the tube  
“ a drum with a spiral spring to force the gas into the supply  
“ pipe to the burner in the roof of the carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 4.—No. 2728.

HARRISON, ELI JAMES. — (*Provisional protection only.*)—  
Attaching door handles to their spindles. The inventor says  
“ In attaching an inside carriage door handle to its spindle  
“ according to my invention, I construct the parts in the  
“ following manner:—I provide the head of the handle with  
“ a cylindrical or other shaped boss having a square hole in  
“ its axis, the said hole passing nearly through the whole  
“ length of the said boss or head. In front of the said boss  
“ or head a circular recess or chamber is made, which opens  
“ into the square hole in the axis of the boss or head. The  
“ said recess or chamber is nearly of the diameter of the boss  
“ or head. The end of the square spindle to which the handle  
“ is to be attached is made taper, and the hole in the axis of  
“ the boss of the handle is made of a corresponding taper  
“ figure. The extreme end of the spindle is made into a  
“ screw.

“ In attaching the handle to the spindle, the boss or head of  
“ the said handle is passed on to the end of the spindle, the  
“ spindle occupying the hole in the axis of the boss, its  
“ screwed end protruding into the circular recess or chamber  
“ in front of the boss. A screw nut of the size and shape of  
“ the said recess is placed therein, and screwed on the end of  
“ the spindle, the said screw nut being made to bear against  
“ the bottom or shoulder of the said recess. The handle is  
“ thus securely attached to the spindle. In order to close the  
“ end of the boss or head, and conceal the screwed nut and  
“ screwed end of the spindle, I make across the circular recess  
“ or chamber a taper dovetail groove. Into this taper groove  
“ a sliding cap or cover is fitted, the inner side of the said  
“ cap or cover being provided with a dovetail of the requisite  
“ size and taper to fit in the said groove. By this means  
“ the end of the boss or head is closed, and a solid appearance  
“ given to the said boss or head. In order to separate the  
“ handle from the spindle the cap or boss is forced out of the



“ groove in front of the boss or head. The screw nut can now  
“ be removed from the end of the spindle, and the handle  
“ withdrawn from off the spindle.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 8.—No. 2764.

ADAMS, WILLIAM BRIDGES.—“ Improvements in locomotive  
“ engines and trains, for the purpose of diminishing wear and  
“ risk on railways, tramways, and common roads.”

This invention is described at some length and under different modifications. The essential features of the invention consist:—Firstly, in a certain “ frame arrangement for  
“ enabling wheels of railway carriages or wagons to turn on a  
“ centre so as to place their axles true to curves or straight  
“ lines, guided by the traction rod or otherwise, with a central  
“ pivot to turn the frame, or with curved guides attached to  
“ the body for the axle boxes to play against in a curved line  
“ fore and aft.”

Secondly, in an arrangement of brakes “ attached to these  
“ frames and following the curved movement of the wheels,  
“ being self acting by means of weighted levers so that they  
“ will always press on the wheels unless lifted, either by the  
“ traction rod, by a chain over pulleys working fore and aft  
“ either way, or lifted by hand or steam, by guard or driver  
“ or by counterbalance weights,” these brakes being also  
applicable to other carriages.

Thirdly, in an “ arrangement of long carriages or others  
“ on six or more wheels, which may be built in lengths and  
“ jointed together so as to be of facile transit in parts, the  
“ centre wheels being fixed as usual in horn plates, and the  
“ end wheels provided with curved beds to their axles  
“ between the wheels, such curved beds sliding between  
“ curved plates fore and aft, attached to the frame which serve  
“ to keep the axles true on curves and straight lines, free  
“ movement being allowed by the springs, which may be  
“ swivelling, or fixed on the axle boxes, and carry the body  
“ by long swinging shackles with ball and socket joints, the  
“ supporting timbers strengthening the body and frame, and  
“ serving as sledges in case of the vehicle getting off the  
“ line,” self-acting breaks being also “ carried by the curved  
“ beds of the axles following the wheels.” This part of the

invention includes the application of similar springs and curved axle beds to "locomotive engines on eight or nine " wheels either with or without friction wheels to give movement and guidance" one arrangement being described which "dispenses with scrolls or timber bearings," the springs used in this arrangement being also applicable to road carriages.

The invention also includes an arrangement of the boilers of locomotive engines which will enable them to retain water "at various levels, like canal locks, when ascending or " descending inclines."

[*Printed, 1s. Drawing.*]

A.D. 1864, November 12.—No. 2819.

MARTIN, CHARLES. — Opening and closing carriage heads. The patentee says "In the front or back part of the carriage " I place horizontally or vertically a wheel or pulley, and at " the reverse or opposite end of the carriage another wheel " or pulley, upon which works an endless cord or band, " suitable guide wheels or pulleys being placed in any " required positions on each side of the carriage to adapt the " said cord or band to the sinuosities thereof. On the head " of the carriage are affixed iron arms, jointed or otherwise " as may be required, to enable them to adapt themselves to " any irregularity of form. At one end of these arms an " endless cord or band is attached, and in order to adapt " itself to the position of the cord or band and relieve " the same of any undue strain, I place on each arm a " slide, to which the cord or band is also attached, and in " the case of carriages which are enclosed by doors, as " landaus or waggonettes, the upper part forming the door " head, I throw this back by a rod affixed at the upper part " on a pin or stud to allow of its moving freely, and at the " lower part or hinge of the head upon a stud in a similar " manner, such lower stud being placed at such a distance " from the centre of the hinge as shall increase the distance " between their respective centres of motion, and so gradually " as the heads fall back or open, also throw back the portion " of the head over the doorway. The apparatus thus described " may be actuated by levers or by any of the known means or

“ combinations of mechanism most suitable to the peculiar  
 “ construction of the carriages to which it is applied or the  
 “ position from which it is desired the same shall be  
 “ actuated.”

[*Printed, 1s. Drawings.*]

A.D. 1864, November 14.—No. 2843.

BAILLY, NICOLAS, DURAND, CHARLES, MESNARD, GEORGE HOWARD, and POIRIER, ZACHARIE.—Axleboxes. This invention relates to improvements upon those partly communicated by C. Durand, and secured by Letters Patent dated 3rd September 1863, No. 2177, granted to Nicolas Bailly, and “consists  
 “ where the bearings are circular in form in the application of  
 “ a cylinder running freely upon the axle or shaft or on a lining  
 “ affixed thereto, supported on spheres, which spheres or other  
 “ equivalent supports enter or work upon a throat or shoulder  
 “ formed on the lining shaft, or axle; the ends of the cylinders  
 “ are cut away in a dished and coned form to receive the spheres  
 “ in suitable openings or embrasures. Where the bearings  
 “ are not circular in form the application may in some cases  
 “ be made to consist of a kind of turntable beneath the shaft  
 “ formed by a basin in the bearing, and by a circular coned  
 “ and dished piece turning freely on a pivot, cut away in a  
 “ curved form on its outer edge to receive spheres, three or four  
 “ or more in number, upon which the turntable piece rotates,  
 “ the spheres entering a throat on the under side thereof on  
 “ the upper surface; it is in contact with and supports the shaft  
 “ or axle, which also rests upon a sphere running within the  
 “ upper surface of the turntable, and entering a throat in the  
 “ shaft or axle, and guided by a friction roller, which is  
 “ supported by chairs in the axle box; in these chairs are  
 “ supported two or more large friction rollers, which are  
 “ above the shaft or axle, there are four tapered and screwed  
 “ keys to firmly adjust and fix the same.”

[*Printed, 8d. Drawing.*]

A.D. 1864, November 29.—No. 2978.

PINAUD, JUSTE.—(*Provisional protection only.*)—Indicator for public vehicles. “The chief feature of the apparatus is a

“ moveable card or dial, which is pricked or marked as here-  
 “ after described. The card or dial is moved by clockwork, and  
 “ receives on its face, opposite the passenger, marks or  
 “ indications of stoppages, journeys when engaged by time,  
 “ and by the ‘ course ’ or distance.

“ There are drawn on the face of the guard three circles by  
 “ preference of different colors, in order that they may be  
 “ the better distinguished. The largest circle on which the  
 “ word ‘ hour ’ may be written, is intended to show the  
 “ number and duration of journeys taken when the cab has  
 “ been engaged by the hour. The middle circle is intended  
 “ to indicate stoppages and their duration, and the innermost  
 “ circle to show the number and length of journeys when the  
 “ cab has been engaged by the ‘ course ’ or distance.

“ The working of the apparatus is as follows:—Suppose a  
 “ person engages a cab by distance or ‘ course,’ the driver  
 “ presses down the handle corresponding to the course or  
 “ distance circle on the card, whereby a mark or indication is  
 “ made on the card, which at the same time registers the  
 “ time of the day, owing to the clockwork constantly impart-  
 “ ing rotary motion to the card. When the cab arrives at its  
 “ destination the driver presses down the handle correspond-  
 “ ing to the stoppage circle on the card; thus, the distance  
 “ between the two marks or indications shows the time  
 “ occupied during the journey. The length of the stoppage  
 “ or the time the cab is disengaged continues until a fresh  
 “ mark or indication is made. At the end of the day the  
 “ card contains a complete register of the day’s work, and  
 “ the amount of fares paid to the driver may be accurately  
 “ ascertained.

“ A double check may be obtained by showing the number  
 “ of journeys performed during the day. I attain this object  
 “ by the employment of a ratchet wheel, which advances one  
 “ tooth for every journey. This movement is imparted by the  
 “ handle corresponding to the stoppage circle, which the  
 “ driver is always compelled to move after every journey,  
 “ whether by time or distance. On the axis of the ratchet  
 “ wheel is a dial plate, the numbers on which in their rotary  
 “ movement pass successively before an indicating pointer.  
 “ Instead of employing one ratchet wheel for obtaining the  
 “ double check, as just explained, two wheels may be

“ employed, and actuated either by the hour handle or the distance handle.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 6.—No. 3031.

LAMPLUGH, HENRY.—(*Provisional protection only.*)—Trucks for sacks or other heavy bodies. The inventor says “my improved sack truck, cart, or carriage consists of a frame of suitable strength of wood or iron mounted on wheels. On the inner side of this frame grooves or guides are formed for the sides of the frame on which the sack or other heavy body rests to slide in. The upper part of the truck frame is jointed or moves on axes so as to partly tilt over, when the sack or other heavy body has been raised upon the sliding frame to the desired elevation which is accomplished in the following manner:—At the back of the main framing of the truck a roller is mounted so as to revolve in suitable bearings on each side; on the axis of this roller a toothed wheel is fixed, to which motion is communicated by means of a crank handle and toothed pinion fixed on another axis upon the framing. One end of a chain or rope is attached to the lower end of the sliding frame, and passes up over a pulley mounted on the upper end of the tilting part of the truck frame, the other end of the chain being fastened to the roller or barrel of the winch previously described. By this means a sack resting on the sliding frame can be raised or wound up by the winch until the sliding frame has passed into the grooves of the tilting part of the truck frame, its further movement is then arrested by chains or stops which connect the two frames together, and by continuing the movement of the winch the tilting and sliding or lifting frame will be caused to tilt over gradually until the frame and sack thereon is brought over to an angle with the mouth of the sack downwards and in a convenient position for its contents to be discharged where required, or transferred into another sack if desired, the mouth of which may be attached to and be held open by a suitable contrivance or instrument on the end of the tilting frame. The movement of the tilting frame may be arrested and secured in any desired position by means of a pall and ratchet, or by other mechanical means, and the sack or other heavy

“ body may be transferred from the sliding frame when  
 “ elevated into a waggon or other conveyance or on to an  
 “ elevated floor or platform. Legs or supports may be jointed  
 “ or otherwise attached to the back of the truck frame, to  
 “ support it firmly in position whilst the sack or other heavy  
 “ body is being elevated thereon, and means or apparatus for  
 “ locking or ‘scotching’ the wheels of the truck may be  
 “ applied thereto if desired. To the front of the truck or  
 “ sliding frame, suitable instruments or apparatus may be  
 “ applied for holding the mouth of the sack open whilst it is  
 “ being filled previous to being raised if required.

“ This improved truck, cart, or carriage may be employed  
 “ for receiving and lowering heavy bodies as may be  
 “ required.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 8.—No. 3063.

PARTRIDGE, EBENEZER. — (*Provisional protection only.*) —

“ Improvements in carriage axles and boxes, and an improved  
 “ tool to be used in the manufacture of carriage axles, and  
 “ for forming grooves or recesses in parts of machinery.”

The object of this invention “ is to prevent the axle leaving  
 “ the axle box in the event of the axle breaking within the  
 “ box.”

One improvement consists “ in forming slot holes in the  
 “ ordinary collar on the axle ; in forming a groove all round  
 “ the circumference of the inner end of the axle box, and in  
 “ inserting screws, bolts, or pins through the slot holes after  
 “ the axle and the axle box are in their proper positions for  
 “ work ; the screws or pins lie in the groove on the axle box,  
 “ and should any breaking of the axle take place inside the  
 “ box they retain the parts together.”

Another part of the invention consists in “ reversing the  
 “ right and left screw threads on the ends of the journals of  
 “ those axles known as Collinge’s axles ;” “ firing of the  
 “ box ” being thus prevented.

A tool is described which is applicable “ for the purpose of  
 “ recessing the outer face of the collar in axles,” such tool  
 consisting of a tube formed with a projecting lump at the  
 lower end, this lump being made with a groove or recess into

which steel cutters are fitted. The tool is fixed in a drilling or other like machine, the journal of the axle being inserted into the tube, and the cutter being made to project from the bottom of the lump through a distance equal to the depth of the recess to be made. "The tool is made to rotate, and its rotation is continued until the required quantity of metal is removed, when the work is ready for finishing in a lathe."

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 9.—No. 3064.

JOHNSON, JOHN HENRY.—(*A communication from Reuben Trumbull Monroe Wells.*) — (*Provisional protection only.*) — Facilitating the starting of carriages. "According to this invention a ratchet wheel is secured to the centre of the axle or axles of the carriage, which wheel is enclosed in a hollow pulley provided with long bosses and turning loosely upon the axle. A pall is fitted inside this pulley, which pall when released and the pulley is turned engages into the teeth of the ratchet wheel and causes the axle to rotate. A chain is passed round the periphery of the pulley and secured thereto at one end, the opposite end of such chain being attached to the centre of a short cross draught bar, and to ends of this draught bar are attached chains leading to a tapered metal slide fitted in a guide in one or both ends of the carriage. It is to this tapered metal slide that the draught chain is attached. On each side of the chain pulley there is fitted a stationary cam, upon the raised periphery of which rests a pin passed through slots in the side of the pulley and through the pall inside. By this means the pall is held out of contact with the ratchet wheel until the pin passes off the raised or extended portion of the cams, but after leaving that part of the cams the pall is free to engage with the ratchet wheel. A coiled spring or a weight is employed for turning the pulley in a reverse direction and setting the apparatus again when the strain of the draught chain ceases. In order to prevent the cams or eccentrics from revolving they have each a projecting button on one side which enters between forked bracketts secured to the under side of the framing. On the

“hauling power being applied it is transferred to the chain pulley causing it to revolve in the same direction as the running wheels for a certain distance, when the pall being relieved from the cams it drops into the teeth of the ratchet wheel, and as this wheel is firmly secured to the axle it is rotated with an increased power due to the leverage of the radius of the drum. On the chain being fully drawn out, the draught bar comes against a fixed stop in the under framing and the carriage then moves under the ordinary conditions.

“When the hauling power ceases the chain is drawn back and wound round the pulley again by the action of the coiled spring or weight above referred to; and when the pin in the pall comes against the raised portion of the cams it is lifted out of the ratchet teeth and is held in readiness for action so soon as the power is applied again. In case of a breakage of the chains the sudden reaction of the pulley consequent on the coiled spring is prevented by means of stops placed in the peripheries of the cams or eccentrics.”

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 9.—No. 3066.

ROBERTS, THOMAS HUMPHREY. — Applying brakes. When apparatus according to the invention “is to be applied to an omnibus or other carriage having a pole and locking apparatus, a bar is applied in front of the fore wheels, and such bar is arranged to be fixed to the back end of the pole, so that it may be moved outwards a short distance with the pole when the horses are drawing. At the ends of this bar the outer traces of the horses are attached by which the ends of the bar will be drawn away from the fore wheels. Near the ends of the bar and at the back surface thereof two breaks or friction blocks are affixed, one to break each of the fore wheels. The ends of the inner traces are fixed as heretofore. Hence it will be understood that when the horses are drawing a carriage the breaks will be away from the wheels, but immediately the speed of the horses is reduced, whether on a level road or going down hill, the fore wheels of the carriage will come against



“ the breaks, and will thereby be retarded from turning. In  
“ a similar manner may apparatus be applied to two or four-  
“ wheeled carriages when shafts are used.”

[*Printed, 1s. Drawings.*]

A.D. 1864, December 17.—No. 3128.

SALMON, PETER.—(*Provisional protection not allowed.*)—“Im-  
“ provements in the rolling stock of railways, and traction  
“ engines and carriages for common roads.”

One part of this invention consists in constructing carriages  
“ partly of iron and partly of steel ” with suitable spaces for  
the reception of steam generators or expanders, and other  
apparatus connected with the propulsion of such carriages,  
and also an “electoral embrage,” being “an apparatus which  
“ communicates with all the breaks of the carriages in a  
“ train, worked by electricity, springs, and rack wheel,” this  
rack wheel being described as “a magnate under the control  
“ of the engine driver or other official,” with an “electoral  
“ insulator” in the shape of a small lever, tightening or  
“ slackening all the breaks at once,” an “electoral wire”  
being mentioned, which is apparently meant to pass the whole  
length of the train, such wire, in the event of couplings break-  
ing, or a part of the train running off the line, becoming  
disconnected or broken, and causing the brakes to stop the  
train, “the breaks being all self-acting by springs or cylin-  
“ drical steam cushions, and taken out of gear and sustained  
“ there by the embrage.” The carriages are also provided  
with gangways, passing along the sides or down the middle  
of such carriages. The carriages are also mentioned as having  
two or three floors, the level of the first or under floor being  
only a few inches above the level of the way, and being fur-  
nished with sleeping and other accommodation, stairs leading  
from the lower to the upper floor, and the latter being  
arranged, if desirable, as a promenade. In snowy weather a  
projecting bow or stem is fixed to the first carriage to clear  
the way and in “summer weather” the roof of the upper floor  
is composed “of iron, wood, or glass to coil up at the sides  
“ or top on revolving spindles.” Wheels are described as  
being made “solid or armed of cast steel” each wheel having  
“ a flange for each side of the rails,” and working “singly  
“ with hollow steel or solid axles,” oscillating “in their

“ frame or fixing, and bearing up the carriage with vertical  
 “ circular steel springs or india-rubber washers,” the sides of  
 the carriage overhanging the wheels.

Wheels suitable for carriages for common roads are mentioned as being composed of wood, iron, or steel either solid or armed, and with oscillating axles, as mentioned above, the tyres of the wheels being clothed with pieces of wood “at set  
 “ distances;” these carriages being also formed with an upper and a lower storey, and driven by steam, several carriages being connected together if desirable. Such carriages are provided with steering apparatus and other suitable adjuncts and for the convenience of passengers alighting from these, or from railway carriages, a “stepping carriage is used, which consists of “a platform on two pair of wheels with upright  
 “ handrails.” Such a platform may be made to travel with railway and other vehicles and serve to enable persons to alight therefrom without the vehicle stopping being disengaged from such vehicle when a person has stepped upon it, and coming gradually to a stand. Another part of the invention consists in altering the seats and backs of all classes of railway and other carriages “from the horizontal and vertical to angular lines, which allows the traveller’s heads  
 “ and upper part of the chest to incline backwards when in a  
 “ sitting position.”

The invention is described at some length, and includes various particulars relating to propulsion, signals, and other matters, none of which, however, require notice here.

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 31.—No. 3259.

DU BOULAY, THOMAS.—Propelling vehicles. “This invention has for its object improvements in carriages propelled by  
 “ manual power. For these purposes a carriage is constructed  
 “ to move on a pair of hinder wheels, and a pair of fore wheels.  
 “ The fore wheels and axles have a locking motion, in the ordinary manner, for facilitating the guiding of the carriage. On  
 “ the axle of the hinder pair of wheels, and about midway between the pair of wheels is a pinion. The person in the carriage sits on a seat over the hinder axle, and by his hands gives  
 “ a to-and-fro motion to a handle or handles in front of him.  
 “ The handle is connected to a pair of toothed racks, between

“ which the pinion on the hinder axle is situated. The racks  
“ are formed together into a frame, which slides to and fro.  
“ The two racks are at such a distance apart that when the  
“ teeth of one rack is in gear with the teeth of the pinion,  
“ the teeth of the other rack are out of gear with the pinion;  
“ hence, when the handle is moved to and fro, the racks are  
“ moved to and fro also, and by being caused to rise and fall  
“ at the end of each stroke, the teeth of the two racks alter-  
“ nately gear with the pinion, and cause it to rotate continu-  
“ ally in one direction. The feet press against the forward  
“ axle or against projections thereon, by which the fore part  
“ of the carriage acts as a stretcher in a boat, and the carriage  
“ is guided by the feet acting to cause the fore axle to per-  
“ form its locking action. In the place of a single pinion,  
“ two pinions may be used, a small and large one, in which  
“ case the pair of toothed racks will be at sufficient distances  
“ apart for the larger pinion. By these means there will be  
“ two powers, a quick one and a slow one, which can be used  
“ as circumstances require.”

[*Printed, 10d. Drawing.*]

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## 1865.

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A.D. 1865, January 3.—No. 14.

LLOYD, HENRY.—Improvements in perambulators and carriages. The first part of this invention consists in contriving the handle of a perambulator in such manner that it may be folded down when not in use. The handle is hinged to the body and “a spring catch fastening or a button” serves to fix the handle in position.

The second part relates to a mode of securing perambulator and other wheels on their axles. The patentee says, “I connect a circular plate to the inner side of the hub or nave of the wheel, the plate being connected to the hub by means of a screw or pin near the circumference of the plate. The plate is capable of turning on the screw or pin as a centre. The plate has a circular hole in its centre of sufficient size

“ for the axle to pass through, the hole opening into a larger  
“ hole between the centre and periphery of the plate. A  
“ curve struck from the screw or pin in which the plate turns,  
“ passes through the centres of both holes. When the plate  
“ is in its normal position, that is, is concentric with the hub,  
“ the wheel cannot be drawn from off the axle, the centre  
“ hole not being sufficiently large to allow of the passage of  
“ the flange of the axle, but when the plate is turned so as  
“ to bring the larger part of its opening concentric with the  
“ axle, the wheel can be drawn from off the axle as the said  
“ large part is of such a size that the flange of the axle can  
“ pass through it. The plate is provided with a spring at its  
“ back, which when the plate is in its normal position, en-  
“ gages with the hub of the wheel, and retains the plate in  
“ its position. The range of motion of the plate is limited  
“ by a second screw or pin in the hub engaging in a slot in  
“ the plate. Or for greater security I employ two of the  
“ plates described, both plates turning on the same screw or  
“ pin as a centre, but turning in opposite directions. In this  
“ case both plates must be moved from their normal positions  
“ before the wheel can be removed from the axle. Or I give  
“ the plate a sliding motion instead of the motion about a  
“ centre as described. In this case the plate slides in guides  
“ in the hub and is pressed to its normal position by a spring.  
“ Or I employ one plate having in its centre a hole not large  
“ enough to let the flange of the axle pass through it. In  
“ this case the plate is divided into two halves, each being  
“ capable of turning on a centre. By the opening of the  
“ half plates the wheel may be removed, and by closing them  
“ it may be fixed. Spring-catch fastenings hold the half  
“ plates in their normal position.” Other modifications are  
mentioned.

[*Printed, 10d. Drawing.*]

A.D. 1865, January 7.—No. 55.

GALLOWAY, GEORGE BELL.—“Improvements in motive  
“ power and means of communication between passengers  
“ while travelling, and appliances connected therewith.”

Part of these improvements relate to the construction of an  
engine to take the place of horses on common roads. In

length the engine corresponds to the space "occupied at present by horses." The framework is of metal, and the driving wheels are flanged or made "like unto a garden roller." The framework may have seats for passengers "upon the top and sides of it," and on each side "underneath the seat" the patentee affixes "a tube having glasses of magnifying power (if required) within it, in order that the engineer or guard may perceive more clearly distant objects." The steering is effected by "a centre wheel" worked from one or both ends. There may also be affixed "a centre guiding wheel to omnibuses and other conveyances," and the friction in turning them may be obviated by sheaves or rollers. The engine is provided with means of silencing the exhaust. The patentee also describes the use of air pumps as a motive power.

For the purpose of effecting communication between passengers, a central passage may be made through the seats, the backs opening on doors and the seats lifting. Tubes and whistles are also fitted and glazed, or wire protected apertures enable a view to be had of one compartment from another.

A brake worked by the horses in holding back, the movement being communicated through the pole, is also described. This brake may also be worked by the reverse pressure of the propelling engine.

[*Printed, 6d. No Drawings.*]

A.D. 1865, January 12.—No. 101.

BARNES, FREDERIC, HANCOCK, DAVID, and COWPE, EDWARD.—Electro-magnetic brake. The patentees thus describe their invention:—"Our invention consists in applying to the wheels of a carriage or machine electro-magnetism as a break power in the following manner:—Supposing we apply our invention to the wheels of a railway carriage, we fit the magnets by preference on the under side of the said carriage, and in a suitable frame. This frame is mounted on grooved wheels, free to travel within certain limits between rails or guides, and the magnets in the frame are in communication by wires with a battery or batteries in the guard's van, or on the engine. At all times, except when the break power is applied, the magnets are somewhat

“ withdrawn from the wheels of the carriage, and are so  
 “ maintained by a spring or springs united at one end to the  
 “ frame carrying the magnets, and at the other to a bar fixed  
 “ by preference at or near the central part of the under side  
 “ of the carriage, but on the current being applied the mag-  
 “ nets are thereby caused to advance against the wheels, and  
 “ in so doing the grooved wheels, and with them the frames  
 “ and magnets travel along the guides or rails, and as the  
 “ magnets approach the wheels, the rotation thereof is stopped.  
 “ Where the wheels are not wholly formed of metal we apply  
 “ plates of metal to them. Upon the wires being disconnected  
 “ the magnets recede from the wheels between the rails or  
 “ guides as before described, and so return to their normal  
 “ position, the spring or springs before referred to being the  
 “ power used to draw them back. We prefer to apply the  
 “ magnets alternately to the wheels, but they may be applied  
 “ to all the wheels, and this can be done to every carriage,  
 “ as all the frames carrying their magnets are connected to-  
 “ gether by wires, so that upon the circuit being completed  
 “ by the guard, driver, or other attendant break power may  
 “ be simultaneously applied to all the wheels throughout a  
 “ train, and the power at the same time regulated according  
 “ to the intensity of the current employed.”

[Printed, 8d. Drawing.]

A.D. 1865, January 21.—No. 182.

DOBSON, HENRY ARNOLD. — (*Provisional protection only.*)—  
 Step. “ To the under side of the door is attached, by a move-  
 “ able joint, a lever connected to a slide working in a grooved  
 “ slot underneath the body of the carriage. At any con-  
 “ venient point, either in the afore-mentioned lever or slide,  
 “ a connecting lever is attached by a moveable joint acting  
 “ upon the rod, which carries the step in such a manner that  
 “ when the door is opened the step is thrust forward, and vice  
 “ versâ. The rod or bar which carries the step is supported  
 “ by two short moveable connecting pieces attached to the  
 “ body of the carriage by moveable joints so as to fold close  
 “ up under the body of the carriage, the one at the hinder  
 “ end having a double joint, so that any pressure on the step  
 “ will prevent it from sliding back of its own accord, and so

“ closing the door upon any person in the act of getting in  
“ or out of the carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, January 25.—No. 215.

FULLER, STEPHEN LEEDHAM, FULLER, ARTHUR and MARTIN, CHARLES.—Carriage fronts. These improvements relate to the moveable fronts of landaus and similar carriages. “The framing  
“ of which the front portion of the carriage head is formed is  
“ provided with hinges or joints at the angles thereof, so that  
“ the frame immediately behind and parallel with the driving  
“ seat shall be capable of falling towards the same in a sloping  
“ position. The top part of the carriage front, which is  
“ usually covered with leather, is jointed to the said last-  
“ mentioned frame, and is capable of falling and resting upon  
“ the same, thus protecting the glass, while those portions  
“ of the frames which form the front sides of the door framing  
“ fold down in a horizontal or nearly horizontal position upon  
“ the sides of the body of the carriage. The last-mentioned  
“ portions of the framing or door pillars are so constructed  
“ that the glass plates or lights at the sides of the front por-  
“ tion of the carriage can be slid behind or through the door  
“ pillars (which may be constructed with suitable slots therein  
“ for such purpose), and lowered into the door casings, the  
“ latter being made of sufficient capacity to contain the same.  
“ When the framing is raised and placed in its upright posi-  
“ tion the side windows or lights are raised from the door  
“ casings and slid behind or through the door pillars as  
“ before mentioned into the other portions of the framing,  
“ which are suitably grooved to retain them, so as entirely  
“ to close the front part of the carriage; or such side lights  
“ instead of being lowered into the door casings, may be  
“ hung on suitable joints or hinges, so as to fold back upon  
“ the front light at the back of the driving seat. The said  
“ improvements in constructing the front parts of such car-  
“ riages as herein-before referred to not only facilitate the  
“ lowering or raising thereof in the ordinary way, but any  
“ suitable mechanical means can be applied to effect the  
“ same.”

[*Printed, 10d. Drawing.*]

A.D. 1865, January 31.—No. 271.

HENRY, MICHAEL.—(*A communication from Auguste Bernie and Hyppolite Louis Godard Desmarest.*)—Traction engine.

The engine here described is carried on four wheels. The two hind wheels support the driving platform and one larger than the others which are attached by springs to a circular frame pivoting horizontally round a perch pin. This frame is controlled by a pinion worked by a hand wheel from a platform in front of the engine and thus the engine is steered.

The propulsion is effected by means of legs or props. “The legs, which may terminate in broad ends or feet, may be attached to cranks on a pair of cranked shafts geared together, and may be guided laterally by bars working in a slotted frame and connected by cross pieces against which the legs strike in their longitudinal or fore-and-aft travel, so that their inclination may be regulated. The bars may be worked by levers and connecting rods and the legs kept up by springs. The direction of motion may be reversed by another cranked shaft working legs inclined in an opposite direction to the others.”

[*Printed, 8d. Drawing.*]

A.D. 1865, February 6.—No. 321.

MARKHAM, CLEMENTS ROBERT. — (*A communication from William Graham McIvor.*)—“A new method for removing or destroying the momentum of heavy bodies by means of an elastic machine or machines, so as to prevent injury and damage from concussion, applicable to ship cables, ship and fort armour, railway trains, tenders to pier heads and floating piers, gangways, breakwaters, and other similar structures; also as a motive power.”

This invention consists essentially in the employment of a cylinder or drum, capable of revolving upon a fixed axle, and containing a number of coiled springs in the interior, these being secured at one end to the axle and at the other to the cylinder, and capable of acting, by means of chains or ropes, coiled round the drum, or by means of gearing connected with the axis thereof, upon mechanism suitable for various purposes, among which are mentioned controlling the speed of railway trains in descending inclines and aiding them in ascending



other inclines, and the use of the invention as a means of actually propelling railway carriages and likewise carriages on common roads. In these cases the springs are contained in cylinders which operate through the medium of gearing in controlling the motion of or propelling the vehicles. Thus a train propelled by ordinary means, may, when descending an incline, have its speed reduced by bringing into gear with a wheel or wheels on one or more of the axles of the train other gearing connected with a barrel or barrels containing springs, the latter being then wound up by the momentum of the train, and retarding its motion by their resistance thereto; a change of gearing then enabling the wound up springs to aid the train in ascending the next incline by the force they exercise in unwinding. The springs thus serve the purpose of brakes when the train is descending an incline, and may also so serve when the train is approaching a station, being wound up by the momentum of the train after the steam has been shut off from the engine. Similar arrangements are described as being applicable to the propulsion of railway and other carriages, in some cases the drums and springs giving motion to the axles of the driving wheels through the medium of chains and chain wheels, and in order to prevent the speed of such carriages from becoming too great the action of the drum and springs may be controlled by means of suitable brakes.

The invention is set forth at very great length, and includes a number of details, comprising different arrangements of buffers and coupling apparatus, wheels with elastic tires, axle boxes fitted with "anti-friction wheel bearings," and other matters which will only be clearly understood with the aid of the drawings annexed to the specification, many of these matters, moreover, relating to the application of the invention to ships' cables and other objects not connected with the present series of abridgments.

[*Printed, 2s. 8d. Drawings.*]

A.D. 1865, February 25.—No. 537.

ASKEW, JOHN.—"Portable vehicle for teaching children to walk."

"The portable carriage is formed with a suitable shaped rim, by preference circular; to the under side of this rim

“ three or more tubes are attached by pin joints ; within these  
 “ tubes other smaller tubes or rods slide, the lower end of  
 “ which are connected to a large rim by pin joints ; the lower  
 “ rim is also preferred to be of circular form, the inner tubes  
 “ or rods have springs coiled around them, by which they are  
 “ retarded (according to the degree of the strength of the  
 “ springs) from sliding within the upper tubes, by which is  
 “ obtained an elastic action between the upper and lower  
 “ rims. These tubes have at their lower end collars capable  
 “ of being affixed in any desired position by set screws, and  
 “ thus to regulate the height of the upper rim, which receives  
 “ the child or invalid, which upper rim provided has a door  
 “ or opening as heretofore, and which door or opening is  
 “ secured by a lock and key or thumbscrew, to prevent  
 “ the child or invalid falling out of the carriage. The  
 “ carriage is made moveable and noiseless by the use of  
 “ castors of brass or other metal lined with india-rubber or  
 “ any other substance that may be considered preferable, and  
 “ the least or slightest movement of the child’s foot or feet  
 “ gives the facility of going in any direction.”

[*Printed, 8d. Drawing.*]

A.D. 1865, March 1.—No. 573.

HOLIDAY, WILLIAM.—Presses for blocking tires. “The  
 “ improvements relate to the application of steam to presses  
 “ for blocking the tyres of railway and other wheels. The  
 “ tyre to be blocked is placed on a plate supported by or  
 “ forming part of the bed plate of the press ; and this plate  
 “ is for this purpose formed true to one side surface of the  
 “ tyre, the other side surface of which is acted upon by a  
 “ corresponding plate connected to the piston, or it may be  
 “ to the steam cylinder to receive the force of the steam as  
 “ admitted by suitable valvular arrangement in the direction  
 “ and to the extent desired.”

[*Printed, 1s. 6d. Drawings.*]

A.D. 1865, March 2.—No. 586.

KIRKLAND, JOHN.—(*Provisional protection only.*)—Recording  
 number of passengers carried in a vehicle. “ Each seat, that  
 “ is, a certain space allotted or allowed for each passenger, is

“ so arranged or fitted on a hinge, or on pivots or centres, that when it is not being sat upon a spring or balance weight causes it to assume a vertical or inclined position. When a passenger moves or folds a seat from the vertical or inclined into the horizontal position, a lever or rod bent or otherwise attached on the under side of such seat and fitted to move therewith comes into contact with a ratchet wheel and causes a registering apparatus to record the movement. In practice, however, it is simpler to have a shaft, securely closed up in framework, of the length of the whole of the seats on one side of an omnibus, and to have a ratchet wheel to meet the lever or rod from each seat, so that the separate motions of the shaft will be indicated on one registering apparatus acting for a row or number of seats. For the obtainment of correct registration and convenience of passengers, it is advisable to number each seat and to provide a spring bolt, which shall shoot out and lock the seat in a vertical or inclined position as soon as a passenger rises therefrom. When a passenger enters the conductor or guard will pull a handle under his control at the back of the vehicle, having a number corresponding to that of the seat, and allow the seat to be moved or folded into the horizontal position. A wire from the handle to the spring bolt will convey the necessary movement for the withdrawal of the latter. Instead of the whole of each seat being arranged to move or fold, part thereof only may do so, or a framework of a form such as would prevent a passenger from sitting down thereon would answer the purpose.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, March 2.—No. 589.

ROTHWELL, PETER. — Restraining runaway horses. The improvements consist in suspending a horizontal shaft across the vehicle parallel to the axletree, which shaft is free to move or oscillate to and from the axletree. Upon each end of the shaft a pulley is fixed, which may be covered with leather to give adhesion, and each pulley is formed so that it can come in close contact with the hoop or other part of the inside of the nave of the wheel. To the middle of the shaft a part is fitted in which the shaft

“ can rotate, and to this part a rod, chain, rope, or strap is  
 “ secured, which at its other end is attached to or connected  
 “ with a lever, wheel, or screw, or a combination of them.  
 “ By means of this lever, wheel, or screw the shaft can be  
 “ pulled forward, so as to press the leather surfaces of the  
 “ pulleys in close and firm contact with the naves of the  
 “ wheels, consequently the shaft will be rotated when the  
 “ vehicle is in motion. To the shaft one end of a belt, chain,  
 “ or rope is secured on each side, the other ends of which  
 “ are attached to the bit in the horse’s mouth, so that when  
 “ the shaft turns it acts as a windlass to wind up the belts,  
 “ chains, or ropes and ‘pull up’ the horse. When the lever,  
 “ wheel, or screw is turned back or released the shaft and  
 “ pulleys will fall or be pushed back by the movement, or by  
 “ springs or weights, or out of contact with the naves of the  
 “ wheel. It will be seen that any required amount of strain  
 “ or pull can be put and kept upon the bit in the horse’s  
 “ mouth while the vehicle is in motion, as the pulleys, ac-  
 “ cording to the pressure, will slip when sufficient strain or  
 “ pull has been obtained.”

[*Printed, 8d. Drawing.*]

A.D. 1865, March 10.—No. 676.

STARTIN, THOMAS.—(*Provisional protection only.*)—Venetian  
 blinds for carriages, &c. These “improvements are entirely  
 “ confined to the means of actuating the strips or laths of  
 “ such blinds for the purpose of opening and closing the  
 “ same, which consists of a strip of metal or other suitable  
 “ material long enough to extend at right angles to the series  
 “ of moveable laths, and which strip of metal is formed with  
 “ a series of small eyes not only equally divided but exact the  
 “ same distance apart from eye to eye as the axes of the  
 “ strips or laths, and into these eyes small metallic pins work  
 “ secured on the flat or face side of each lath. From this it  
 “ will be seen that by the pulling down or elevating the strip  
 “ of metal, all the strips or laths will be simultaneously  
 “ opened, closed, or set in any desired angle. But for the  
 “ purpose of protecting the action of the laths from undue  
 “ force, the vertical strip is attached to a compound hinge  
 “ joint and plate at the top or bottom end as may be desired,  
 “ which plate with the compound or double hinge or joint is

“ secured to the rail of the frame in which the laths work.  
“ From this description it will be seen that the strips or laths  
“ may be made not only of wood but of any suitable material,  
“ such as wire gauze, supported in a metal binding, and  
“ suitably fitted in a wood, metal, or other frame, such laths  
“ being actuated in the manner herein described and thereby  
“ adapted for carriages, or for screens or blinds for other  
“ purposes.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, March 11.—No. 683.

MARVAUD, PIERRE.—(*Provisional protection only.*)—Releasing runaway horses. “The ends of the furchels of the fore carriage are forked, that is, they have each two branches, and between the branches a ratchet or key piece is securely maintained by a spring, its other side pivoting on a bolt; at the end of each shaft is a strong bolt, which is introduced between the branches of the furchels and secured by the above mentioned key piece; adapted on the branches of each furchel is a cam or nut, which is at the command of the driver (as will be shortly explained), and on causing these cams or nuts to press against their respective springs the ratchet or key piece above mentioned is at once liberated, which permits of the escape of the bolt of the shafts, splinter bar, or carriage pole, as the case may be, and thus immediately disconnects the horses from the vehicle. The coachman works the cams or nuts just mentioned by means of a lever conveniently disposed for that purpose, and communicating with an armature having the form of and placed beneath the furchels of the fore carriage, a connecting rod transmitting the action to the cam or nut; the lever being also connected with the fore carriage, the vehicle may be directed as desired, the impetus carrying on the carriage a short distance.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, March 13.—No. 701.

MARSDEN, ROBERT.—Rolling springs, &c. For this purpose the patentee makes a pair of rolls by sinking or cutting in the surface of a narrow bottom roll, or by otherwise shaping its

periphery, to the counterpart of the spring to be rolled. This roll may have cheeks or not. The upper roll is similarly made to take so much of the counterpart as is not provided for by the lower roll. If the rolls be of large diameter, the depressions or dies may be repeated so as to roll two or more articles at one rotation. As to the driving gear the patentee says:—  
“ As each pair of rolls will require to be of different diameters  
“ to correspond circumferentially with the pattern or patterns  
“ impressed upon them, some difference for the ordinary  
“ driving gear must be made in order to accommodate the  
“ different diameter of the rolls. I accomplish this object as  
“ follows:—To the axle or shaft which carries the first, principal, or bottom roll I attach a small toothed wheel, and  
“ also attach a similar wheel to the axle or shaft which carries the top or second roll. Upon a small countershaft I attach  
“ or key another toothed wheel of a convenient size, and  
“ then by connecting rods bring the three wheels into gear,  
“ and secure the three axles or shafts together, so that whatever may be the size of the rolls, within certain limits, the  
“ toothed wheels will always remain in gear. To prevent  
“ lateral motion of the rolls upon each other, I fix two **V**-  
“ wheels upon the first and two upon the second shaft, and  
“ upon the countershaft two wheels to correspond with and  
“ to work into the **V**-wheels, which are held in their positions  
“ by the connecting rods above mentioned.”

[*Printed, 10d. Drawing.*]

A.D. 1865, March 20.—No. 780.

MACKENZIE, ALEXANDER RICHARD.—Steam carriages and traction engines. “ When steam is employed,” says the patentee, “ I fix one or more boilers to the framework of the  
“ vehicle, and convey the steam to one or more cylinders  
“ placed vertically, horizontally, or diagonally, or use oscillating cylinders for imparting motion to a cross shaft  
“ divided into three parts, and provided with two clutch  
“ boxes of any known construction. The shaft works in any  
“ suitable number of bearings, and carries two chain wheels  
“ or drums communicating by means of chains with other  
“ chain wheels or drums fixed to the naves of the hind or  
“ driving wheels. The said hind wheels revolve upon a fixed

“ axle attached to the framework in any well known manner,  
“ and either wheel can be disconnected from the motive  
“ power by putting its corresponding clutch box out of gear.  
“ To the lock or fore carriage is fixed a toothed wheel or  
“ segment communicating by gearing with a hand or steering  
“ wheel for enabling the vehicle to be steered either to the  
“ right or left, and for shifting the clutch boxes out of gear  
“ there are two levers which are moved as required by the  
“ driver or steersman, so that when the toothed wheel or  
“ segment is turned for turning the vehicle, one or other of  
“ the clutches could be thrown out of gear, and thereby enable  
“ the vehicle to be turned in the radius of its own length.”

“ When compressed air or other motive power is used  
“ instead of steam I employ toothed chains and chain wheels  
“ for turning the hind or driving wheels of the vehicle, and  
“ use similar arrangements for turning and stopping to those  
“ before described; and for agricultural and other machines  
“ travelling at a slow speed and worked by steam or compressed air I employ either spur or friction gearing for  
“ diminishing speed and increasing power.”

The patentee condenses the exhaust steam in closed vessels and uses the resulting water for re-evaporation or for warming the vehicle.

[*Printed, 10d. Drawing.*]

A.D. 1865, March 22.—No. 794.

JACOBS, HIRAM SMITH.—Dressing felloes. This invention relates to a machine by means of which the inner surfaces of wooden felloes may be shaped or dressed. This machine embodies “ a radius frame arranged so as to be capable of  
“ being adjusted to operate or turn from two different points  
“ as centres, in connexion with two cutter heads placed at  
“ such relative position with the points or centres aforesaid  
“ that by a simple adjustment of the radius frame, from one  
“ centre point to the other, the felloe which is clamped to  
“ the radius frame may be brought in cutting position with  
“ either head.” The machine not only rounds or smooths the surface of the felloe but also cuts the necessary bearings for the shoulders of the spokes. For this latter purpose a kind of turnplate or guide moves the cutter bar away from

its work as it arrives at the proper place. A modification of the machine for cutting steamed or bent felloes is described, and there are shown means of making the cutters adjustable.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1865, March 22.—No. 798.

LANE, WILLIAM.—(*Provisional protection only.*)—Propelling vehicles by manual power. “In the fore part of the carriage” says the inventor “I have a double flanged drum, which may “be of wood, iron, or other suitable material, the body of “which works freely through the bottom of the carriage or “other vehicle. On the upper flange I have a frame securely “attached thereto, carrying an axle, on which is secured a “toothed wheel. The said axle is fitted with a crank for the “purpose of turning the wheel. The aforesaid drum is “slotted down in the direction of its length, and in the said “slot is fitted on a revolving axle another toothed wheel, “which gears into the one before mentioned. To the under “flange of the drum is attached the framing, which carries “the springs that support the fore part of the carriage, and “in which framing also is fitted the axle on which are the “road wheels. To this axle is secured a toothed wheel, gear- “ing into one on an independent axle, which works into the “teeth of the wheel aforesaid so that all four work freely “and gear into each other, and when the upper one is turned “by the crank, the road wheels are caused to rotate by reason “of the toothed wheels secured on their axle and those fixed “in the slot of the drum and on the independent intermediate “axle. The springs are not in any way attached to the car- “riage, but press against its under side, and operate by “reason of the carriage or vehicle rising and falling upon “the body of the drum. The carriage or vehicle may be “directed along the road and turned in any direction by “turning the drum by means of a lever attached thereto so “as to be easily accessible by the person working the ma- “chinery or any other attendant, and it may be secured at “any angle by a catch working in slots cut in the upper “flange, or by any other suitable appliances, if required.”

[*Printed, 4d. No Drawings.*]



A.D. 1865, March 27.—No. 863.

BRUCKSHAW, JOHN, and UNDERHILL, WILLIAM SCOTT.  
—Improvements in traction engines. This invention relates to a mode of obtaining adhesion on soft ground and also to means of steering traction engines. The patentees say, “with regard to the wheels, we make the fellos or peripheries of the travelling wheels in a zig-zag or serpentine form laterally, or in the line of the axle, keeping the running surfaces of such peripheries flat and in a line concentric with the axle, so that the bearing of the wheels upon soft land is gained by the impact of the sides of the zig-zag or serpentine peripheries against the earth, whilst there are no projections whatever upon the rolling face of the wheels to impede progress or jar the engine when running upon hard land or roads. The steering apparatus is formed by a connecting rod attached by a joint or swivel to the axle of the locking wheel as far as practicable from the locking centre, the connecting rod being bent so as to allow the nearest locking wheel to lock. The other end of the connecting rod is formed into a rack, into which works a pinion fixed upon a shaft, upon which is hung a hand or steering wheel. This shaft is supported in suitable bearings near the foot plate, so that the steersman standing on the foot plate, or in any other convenient position at the rear of the engine, by turning the steering wheel works the pinion, and thus actuates the rack upon the connecting rod backwards and forwards, thus causing the axle of the locking wheels to make a partial rotation upon its locking centre.”

[*Printed, 10d. Drawing.*]

A.D. 1865, April 5.—No. 962.

ALLEYNE, JOHN GAY NEWTON.—“Improvements in traction engines.”

The patentee thus describes his invention:—“One part relates to a mode of imparting motion to driving wheels of traction engines by means of a worm and worm wheel. For this purpose I arrange two steam cylinders, one on each side of the smoke box, to act upon either one and the

“ same crank or two separate cranks of a crank shaft situated  
 “ in the longitudinal centre line of the engine. This crank  
 “ shaft is connected by means of universal joints or other  
 “ suitable coupling, and an intermediate shaft to the worm in  
 “ gear with the worm wheel fixed on the axles of the driving  
 “ wheels, to the axle boxes of which the framing carrying  
 “ the worm is attached. The worm is made of such a pitch  
 “ as just to be capable of being made to revolve by the worm  
 “ wheel, so that the engine is not made to stop dead when the  
 “ steam is shut off. If, in the above described arrangement,  
 “ both steam cylinders are made to work upon one and the  
 “ same crank at right angles to each other, the slide valves  
 “ to both cylinders can be worked by one and the same cam  
 “ or excentric upon the crank shaft.

“ Another part of my invention has reference to a mode of  
 “ imparting motion to traction engines by means of an end-  
 “ less band or chain passing round a pulley or chain wheel on  
 “ the crank shaft of the steam engine, and round a pulley or  
 “ chain wheel on the driving wheels arranged in such a man-  
 “ ner that either a fast or a slow motion may be imparted to  
 “ the driving wheels. For this purpose the pulley or chain  
 “ wheel upon the axle of the driving wheels is made to run  
 “ loose upon the axle, but is capable of being fixed upon the  
 “ same by means of set screws. To this pulley is attached a  
 “ pinion in gear with a spur wheel fixed upon a separate shaft,  
 “ and upon this is also fixed a pinion in gear with a spur wheel  
 “ fixed on the axle of the driving wheels. By this arrange-  
 “ ment it will be seen that if required to impart a quick  
 “ motion to the driving wheels, the pulley or chain wheel  
 “ upon the axle will have to be fixed upon the same by means  
 “ of the screws before mentioned and the wheel and pinion  
 “ upon the separate shaft be slid out of gear, or thrown out  
 “ of gear, by an excentric or other suitable arrangement,  
 “ when the driving wheel will be driven directly by the  
 “ band or chain. If, on the other hand, it be required to  
 “ impart a slow speed to the driving wheels, the pulley or  
 “ chain wheel is made to run loose upon the axle of the  
 “ driving wheels, when the pinion attached thereto will  
 “ impart a reduced motion to the spur wheel on the separate  
 “ shaft, and the pinion on the latter will impart a still further

“ reduced motion to the spur wheel fixed on the axle of the  
“ driving wheels.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1865, April 8.—No. 1002.

GEDGE, WILLIAM EDWARD.—(*A communication from Alfred Taillendeau.*)—Propelling trains on roads. “ Each waggon  
“ or other vehicle is propelled by its own wheels, and receives  
“ no traction but such as is required to change its direction.  
“ Motion is communicated from one vehicle to the other by  
“ means of transmitting gearing fitted on the centre of the  
“ coupling joint of the several vehicles.” “ The train works  
“ as follows:—The first vehicle carries the steam engine and  
“ its boiler apparatus; it is provided with a fore carriage.  
“ The driver acts on a guide when he wishes to depart from a  
“ straight line. The steam engine gives motion to the  
“ vehicle on which it is placed by means of a crank fitted on  
“ a shaft, which carries a driving pinion; this pinion by  
“ means of toothed gearing, acts on the driving wheels of this  
“ vehicle. The shaft of the crank is further provided with a  
“ pulley, which by means of a band transmits motion to a  
“ double pulley fixed on a vertical shaft, fitted in the centre of  
“ the joint, coupling the first vehicle with the following one.  
“ The coupling joint is formed of two principal parts. The  
“ first is an iron piece bent at right angles and fixed to the  
“ hind part of the vehicle which carries the steam engine;  
“ this piece of iron ends in a ring of the same metal in form  
“ of collar. The second piece is fixed to the vehicle which  
“ follows the first; it is composed of a wrought iron plate,  
“ ended by a semi-circle, the diameter of which is equal to  
“ the distance apart of the two vehicles, and which rests on  
“ the first piece. In the centre of the iron plate is fixed  
“ a drum or iron ring, which enters the ring or collar  
“ ending the piece of the first vehicle, so as to serve as  
“ point of attachment and coupling joint between the two  
“ vehicles. This drum or iron ring carries the supports  
“ of the vertical shaft, which passes through its centre;  
“ this shaft being furnished with a double pulley receives  
“ motion from the pulley of the first vehicle, and transmits it  
“ by means of a band and pulley to the driving shaft of the

“ wheels of the second vehicle. This driving shaft is also  
“ double in order to transmit motion to the vertical shaft  
“ which passes through the centre of articulation or coupling  
“ joint of the second and third vehicle. The pieces which  
“ form this point of attachment or coupling joint are pre-  
“ cisely similar to those above described. The vertical shaft  
“ which is fitted at this point is also provided with a double  
“ pulley, which receives and transmits the motion to the  
“ wheels of the third vehicle, in the same manner as  
“ already described, and so on to a fourth vehicle, or to as  
“ many as may form the train,” “The driving wheels are  
“ provided with ordinary breaks, and the first carriage may  
“ even carry on its fore part a windlass or axletree and chain,  
“ worked when required by the steam engine, and intended  
“ to lift the train from any critical position.”

[*Printed, 6d. Drawing.*]

A.D. 1865, April 11.—No. 1024.

WRIGHT, STEPHEN.—Wheels and axle boxes. According to the patentee these improvements consist firstly “in constructing  
“ the hubs and spokes of carriage and other wheels, whereby  
“ great strength at the junctions of the said spokes with  
“ the hub are secured, combined with neatness of appearance.  
“ I make the hub of a cylindrical boss or short cylinder of  
“ metal having a hole in its axis. In the periphery of the  
“ said cylindrical boss or short cylinder a series of equidistant  
“ radial recesses is made, the said recesses being so deep as to  
“ approach the hollow axis of the boss or short cylinder. The  
“ said recesses are open on one side and are of a taper  
“ figure. The ends of the spokes to be fitted in a hub of the  
“ construction described are of a taper figure and of greater  
“ strength at the taper part than at any other part. In fixing  
“ the spokes in the hub the taper ends of the spokes are put  
“ or driven into the recesses in the hub through the open sides  
“ thereof, and are fixed therein by a plate or cheek of the dia-  
“ meter of the hub made to screw upon the screwed end of  
“ the hub, the said plate having a screw in the hole in its  
“ middle which engages with a screw on the hub. By the  
“ screwing up of this plate or cheek, the open sides of the  
“ recesses of the hub are closed and the spokes securely fixed

“ therein. Or the spokes may be driven in radially instead  
“ of from the side as described. In this case I prefer to  
“ dispense with the radial divisions in the hub and make the  
“ inner faces of the plates or cheeks of the hub inclined from  
“ their circumference to near the axis of the hub the incli-  
“ nation of the said faces being in opposite directions.”

Secondly “ of the following improvements in making the  
“ tyres of carriage and other wheels. I make the tyre of a  
“ trough form, that is with flanges on either side or edge,  
“ the felloes or rim of the wheel being built up in the tyre.  
“ Or I make a flange only on one edge of the tyre and slightly  
“ increase its diameter at the other edge. The last form of  
“ tyre is fixed on the felloes by shrinking in the usual way.”

Thirdly “ of the following improvements in fixing the  
“ wheels to their axle boxes. In fixing the hub of the wheel  
“ to the axle box I make the hole in the hub slightly taper,  
“ and I also make the axle box slightly taper, and I force the  
“ hub on the axle box and fix it thereon by hydraulic or other  
“ pressure. The axle box is secured to the axle by a screw  
“ cap of the ordinary kind, and the said cap is protected  
“ from injury by a short hollow cylinder of metal fixed on the  
“ axle box.”

[*Printed, 1s. Drawings.*]

A.D. 1865, April 17.—No. 1075.

MORGAN, EDWARD, and MORGAN, GEORGE HENRY. —  
Covering trucks, &c. “ For this purpose the ends of a truck  
“ or van or other carriage are by preference, made semi-  
“ circular at the top, and to stand up considerably higher  
“ than the sides, but this is not essential in all cases. On  
“ these or other suitable ends are centres or axes; each centre  
“ or axis has on it two radial arms which are connected  
“ together in pairs at their outer ends by two horizontal bars  
“ passing from end to end of the truck or van or other car-  
“ riage, thus two frames are formed; and to these are fixed  
“ the tarpaulin or other covering material, which is divided  
“ into two sheets; one edge of each sheet is fixed all along  
“ the horizontal bar of one of the frames. The other edge of  
“ each of the covering sheets is fixed along the upper edge of  
“ the side of the van, or truck, or other carriage; thus it will

“ be seen that when the radial arms are down in their lowest  
“ position on each side of the van, or truck, or other carriage,  
“ the covering sheets are folded up close against the sides  
“ of the truck, or van, or carriage which is then open; but  
“ when the radial arms are raised to an upright or vertical  
“ position, or somewhat beyond, the two sheets meet over  
“ the middle of the van, and form an arched roof over it.  
“ The ends of the covering sheets are retained by having  
“ rings fixed upon them, which rings slide along guide rails  
“ or cords fixed to the ends of the van. The radial arms may  
“ each be raised and lowered by means of a connecting rod  
“ which connects it to a bell-crank lever turning on a centre  
“ or axis fixed on the end of the van, or truck, or other  
“ carriage. The two bell-crank levers are moved at the same  
“ time by means of a bar running from end to end of the van  
“ or truck or other carriage underneath its platform, which  
“ has motion communicated to it by means of a screw or by  
“ other convenient gear. The radial arms of the covering  
“ sheets may however be moved up or down by other arrange-  
“ ments of levers and gearing.”

[*Printed, 1s. 8d. Drawings.*]

A.D. 1865, April 19.—No. 1090.

RIDDELL, WILLIAM.—(*Provisional protection only.*)—Covering trucks, &c. This invention consists principally in the use and adaptation of what are known as “flexible shutters” or “revolving shutters” for the purpose of covering carriages.

“The truck, van, or other carriage to be so covered or protected must be furnished with an iron framing (as high as the goods are intended to be laden or rather higher) having grooves wherein the ends or sides of the shutter slide. The shutter should be made (by preference) of iron, but it may be of any other suitable material, and it may either be wound on a roller by means of a handle when not in use, or it may be made self-coiling by means of springs, and so arranged as to slide into a box at the end or under the bottom of the truck, van, or carriage. The shutters, when placed over the goods, may be locked or otherwise secured.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, April 19.—No. 1091.

GILBERT, FREDRIC WILLIAM.—(*Provisional protection only.*)  
—Raising and lowering apparatus for vehicles. “This invention relates to an article used more particularly by brewer’s draymen called a ‘pulley,’ employed for rolling barrels or casks into and out of drays, and the improvement consists in adapting rollers thereto furnished each with a rack and pawl at one end or both ends thereof, said racks and pawls being so arranged as to allow the aforesaid rollers to rotate only in one direction if necessary. For example, suppose it be required to raise a flat-bottomed packing case into a waggon or other like vehicle, when pushed up the pulley the rollers will revolve in the same direction, *i.e.* towards the tail end of the waggon, and the ratchet and pawls will prevent said rollers from moving in an opposite direction, by which the tendency of the weights to slide or move back will be prevented or very considerably lessened. The rollers aforesaid are intended to be placed loosely upon the tie rods employed to keep the timber sides of the pulley securely together and at any required distance apart, and the pawls are fixed to the inner sides of the aforesaid pieces of timber. The pawls may be lifted and kept out of gear with the racks if desired.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, April 21.—No. 1120.

NEWTON, HENRY EDWARD.—(*A communication from Auguste Quitzow.*)—Carriages for invalids. “The object of this invention is to so construct carriages as to make them impervious to the exterior air, and thus to preserve in the interior air more or less compressed as may be thought advisable for the transport of certain classes of invalids. To effect this the carriage is made of strong and tenacious wood, the different parts of which are strongly jointed, screwed, and then covered with sheet iron of a sufficient thickness to resist considerable pressure where the iron and wood join; caoutchouc or other suitable material may be introduced to render these parts completely air-tight; caoutchouc or other suitable material is also put round the doors and windows of the vehicle for the same purpose.

“ The compression of the air in the carriage is caused by  
“ two small air pumps placed in a box under the seat, and  
“ they are worked by means of a rocking shaft and levers  
“ connected with excentrics fixed on the hind wheels. The  
“ air from the pumps is conveyed into the carriage through  
“ a pipe passing up the back of the carriage nearly to the  
“ top. The opening of the pipe which admits the air into  
“ the interior of the carriage is provided with a piece of some  
“ porous material, in order to prevent the entrance of dust  
“ or any extraneous matters into the carriage; this porous  
“ material may be supplied with any medicament suitable for  
“ the disease to be treated.

“ A small valve is placed in the roof of the vehicle in order  
“ to regulate the degree of compression.”

[*Printed, 10d. Drawing.*]

A.D. 1865, May 10.—No. 1290.

FULLER, STEPHEN LEEDHAM, FULLER, ARTHUR, and MARTIN, CHARLES.—Carriage step. “ A bar of iron is placed  
“ immediately below the rocker and the door of the carriage,  
“ the same being provided with trunnions at the ends thereof,  
“ by means of which the bar is retained in bearings of a  
“ suitable character attached to the carriage in such manner  
“ that the said bar will work freely therein. A portion of  
“ the bar is cut away so as to reduce the centre part thereof  
“ to a semi-cylindrical form, recesses being made in the bar  
“ for the reception and passage of the sides of the step as  
“ herein-after mentioned. The sides of the step consist of  
“ angle iron, the treads being formed of iron plates secured  
“ to the sides by pivots, upon which they can freely turn,  
“ transverse bars,” or stops, “ being so placed as to support  
“ the treads when in a horizontal position and ready for  
“ use.” “ Upon the step being raised the treads are drawn  
“ by a rod into a position parallel with the sides, thus allow-  
“ ing the step to be pushed backward under the bottom of the  
“ carriage, where it is retained by means of a shelf or case or  
“ other analogous contrivance.”

[*Printed, 1s. Drawings.*]



A.D. 1865, May 12.—No. 1323.

DONOVAN, RICHARD EDWARD, and O'BRIEN, DANIEL. — (*Provisional protection only.*)—Increasing adhesion of driving wheels. This invention has for its object “to render the  
“ power of traction wholly or partially independent of the  
“ weight of the engine, and consists in causing the driving  
“ or traction wheels to be pressed by means of springs, compressed air, steam, or other suitable power, in such a  
“ manner against rails, bars, chains, projections, or surfaces  
“ fixed to or formed on the road or permanent way, that such  
“ pressure is wholly or partially independent of the force of  
“ gravity. For this purpose the driving wheels are by preference placed in a horizontal or slanting position, and are  
“ kept pressed against the side surfaces either of the ordinary  
“ rails of railways or of a bar or bars or projections fixed  
“ between the rails or upon common roads, the axles of the  
“ wheels being so arranged as to be capable of yielding to  
“ the pressure of the spring or other power employed for  
“ forcing the wheels against the rails. Or the driving wheels  
“ may be placed in a vertical position, as heretofore, and  
“ pressed by spring or other power upon either the upper or  
“ under surface of the rails, the locomotive or traction engine  
“ being in that case provided with other wheels acting upon  
“ the opposite surfaces either of the same or other rails, so  
“ as to afford the requisite resistance to the force of the spring  
“ or other power.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, May 19.—No. 1388.

READ, GEORGE.—(*Provisional protection only.*)—Manumotive carriage. The following is the inventor's provisional specification:—“ My improvements in manumotive carriages relate  
“ to the apparatus for communicating motion to the wheels  
“ whereby the carriage is propelled. For this purpose I place  
“ a screw wheel on the driving axle of the carriage. Gearing  
“ into this screw wheel (as a substitute for the endless screw  
“ usually working in endless screws) is a disc having a series  
“ of friction bowls arranged round its periphery, these bowls  
“ take into the teeth of the screw and by the rotation of the  
“ bowl disc cause the screw wheel to rotate and so propel the

“ carriage. I place this bowl disc on a vertical or inclined  
 “ shaft and continue it upwards to any convenient position  
 “ for driving by means of a winch handle or other convenient  
 “ means on the top. I place a universal joint on this driving  
 “ shaft whereby it may be inclined and adapted to any  
 “ position desired for the convenience of driving. I steer  
 “ the vehicle by means of the fore wheel or wheels mounting  
 “ it or them on an axis and in bearings in which the axis can  
 “ be moved in the different directions required for steering  
 “ the vehicle, such motion being communicated by means of  
 “ a hand lever and connecting rod, or it may be operated by  
 “ the feet of the operator. According to this arrangement  
 “ the one hand is engaged in driving the winch handle while  
 “ the other may effect the steering. Instead of a winch or  
 “ crank handle a lever may be employed to transmit motion  
 “ to a crank on the bowl disc shaft; such may also be driven  
 “ by a treadle; a fly wheel may further be added to the latter  
 “ shaft or to the screw wheel shaft (running wheel axle).”

[*Printed, 4d. No Drawings.*]

A.D. 1865, May 31.—No. 1495.

HAZELDINE, FREDERICK. — (*Provisional protection only.*)—  
 Framing and construction of vehicles. “ This invention con-  
 “ sists in substituting wrought iron latticework, or a com-  
 “ bination of iron and woodwork, on the girder and tension  
 “ principles, in place of the ordinary wooden framing at  
 “ present employed in the construction of vans, waggons, or  
 “ carts, and in covering the whole with corrugated metal  
 “ (zinc by preference) mahogany panelling, tarpaulin, ma-  
 “ cintosh, or other suitable material, and further in arranging  
 “ or disposing the rods employed to form the sides of the  
 “ vans, waggons, or carts, either in parallel lines to each  
 “ other or diagonally to the bottom sides of the vans, waggons,  
 “ or carts. By the above improvements the vans, waggons,  
 “ or carts may be made very considerably lighter, much more  
 “ durable, and can be more easily repaired than heretofore.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, June 13.—No. 1604.

GRIFFITHS, JAMES.—Self-acting brake. The patentee says,  
 “ in constructing a four-wheeled carriage for common roads

“ according to this invention, I construct the turn plate for  
“ the fore carriage of two circular plates or rings connected  
“ by a central bolt, the upper ring being attached by iron  
“ loops to the body of the carriage, and the lower ring firmly  
“ connected to the under carriage, and by means of the  
“ springs to the fore axle; the pole or shafts is or are firmly  
“ connected to this lower ring. So far it resembles the  
“ ordinary arrangement, but instead of the central bolt  
“ merely passing through circular holes in the turn plates, so  
“ that they have merely a revolving or turning motion one  
“ over the other, I construct the upper plate with a slot or  
“ mortice, so that it is capable of a sliding motion in the  
“ direction of the draught as well as a turning motion round  
“ the central bolt. To the centre of the lower plate is hinged  
“ a connecting rod attached at the other end to a cross bar  
“ carrying two break blocks a little in advance of the front  
“ part of the tires of the hind wheels. The result of this  
“ arrangement is that as soon as the horses are checked  
“ the progress of the under carriage is checked also, whilst  
“ the impetus of the body of the carriage carries it still  
“ forward, and the upper plate sliding upon the lower (in  
“ consequence of the slot or mortice), the tires of the hind  
“ wheels of the carriage come in contact with the break blocks,  
“ and thus the break is self-acting.” “In order to prevent  
“ the break from acting when the horses are backed, a stop or  
“ bolt is depressed (by means of a treadle or lever) by the  
“ driver, so as to fill up the slot or mortice, and thus prevent  
“ the turn plates or rings from sliding one over the other.”

[*Printed, 8d. Drawing.*]

A.D. 1865, June 14.—No. 1613.

COURTAULD, SIDNEY, and ATKINSON, CHARLES WILKINS.  
—Opening and shutting carriage windows. This invention  
“ consists in an excentric motion worked by a hand lever or a  
“ disc, describing either a whole revolution or only the arc of  
“ a circle, so arranged as to be easily accessible, and to be  
“ capable of being turned when it is desired to raise or lower  
“ the window to any required distance. The afore-named  
“ excentric works a lever to which is attached a chain, cord,  
“ or gut passing round a pulley. Another pulley and cord  
“ or gut derives its motion from the first-named pulley, and

“ is constructed of such diameter as to give the requisite  
 “ distance of motion to the window. The said cord or gut is  
 “ passed round pulleys at or about the top and bottom of the  
 “ bottom sash, and is fixed to the bottom of the window frame  
 “ at or about the centre thereof, by which means when the  
 “ excentric is turned by the hand the window is raised or  
 “ lowered as required. The weight of the window is  
 “ counteracted by a spring or weight, whereby the window  
 “ can be raised with greater ease. The force of the spring  
 “ or weight, combined with the mechanical action of the  
 “ excentric allows the window to remain at any required  
 “ height.”

[*Printed, 8d. Drawing.*]

A.D. 1865, June 15.—No. 1626.

BONNEVILLE, HENRI ADRIEN. — (*A communication from Joseph François d'Artemn.*)—Facilitating starting and traction of vehicles. The trace bars are fitted with rods attached to the ends of levers arranged under the fore part of the vehicle. The ends of these levers compress strong springs and they, in their turn, are caused to push forward the vehicle. It is claimed that by this apparatus shocks at starting are prevented.

[*Printed, 6d. Drawing.*]

A.D. 1865, June 17.—No. 1637.

HOWES, WALTER, and BURLEY, WILLIAM.—Lamp irons and door handles. “ This invention,” says the patentee, “ relates  
 “ to what we term an improved lamp iron or iron arm and  
 “ lamp fixing to be applied to railway and other carriages,  
 “ first, to carry, and secondly, hold the lamps, and, thirdly,  
 “ to facilitate the attaching and fixing the lamp to the car-  
 “ riages, and unfixing and detaching the same therefrom.  
 “ The improvements are effected partly in the lamp and  
 “ partly in the lamp iron, and the fixing and unfixing parts  
 “ are also capable of being applied for attaching and fixing  
 “ handles to railway and other carriages, so that the same  
 “ when thus fitted can be easily and readily detached and  
 “ refixed when it is required to clean them, or for preservation  
 “ from tarnishing or other deterioration when the carriages  
 “ are not in use.

“In applying our invention to lamps we dispense with the common socket iron, and substitute therefor a semi-cylindrical hollow socket with a hollow thread cut out a certain distance along the periphery, and fixed to the lamps and by preference formed of brass or other suitable metal, and a short arm fixed to the carriage, which we usually make of iron, the outer end of which is formed with a tongue turned upwards at the end, round which tongue and solid therewith a half collar and half screw are formed, terminating with a short length of entire screw the tongue on the arm (or lamp iron) fixed to the carriage fits into the socket fixed to the side of the lamp, the two half screws then form an entire screw, over which a screw collar or nozzle is then secured, the lamp becomes firmly fixed and secured to the carriage, when detaching the lamp the screw collar is simply turned a few turns back till it clears the two half screwed portions of the socket and tongue, but still remaining on the entire screwed portion before mentioned by slightly lifting the lamp, and at the same time pulling it forward it is instantly freed from the carriage and vice versâ.

“In applying our improved fastening to carriage door and other handles, we make the studs or other fixing media which are usually formed entire, and fixed to the carriage in two parts detachable one from the other, one part being formed on the handle, and the other on the carriage stud, both being screwed externally, and fixed securely together by means of a collar as before described.”

[*Printed, 6d. Drawing.*]

A.D. 1865, June 23.—No. 1680.

DOBBS, ARCHIBALD EDWARD.—(*Provisional protection only.*)—Drags. “A skid is fastened by means of a bar to a collar playing freely on the stock or nave of the wheel intended to be retarded. When the drag is not in use the skid is held up by a catch in front of the wheel, which is then free in revolving; and when the drag is to be used the catch being moved allows the skid to clip the wheel and to be carried down by it until it is between the wheel and the ground; a projecting piece attached to the skid then comes in contact with the catch, and the drag is thus fixed. When

“ the skid is to be released the catch is again moved, and the  
 “ skid is carried by the wheel until arriving at its first position  
 “ it is caught by the catch and held till again required, and  
 “ at the same time is caused no longer to clip the wheel, which  
 “ then can revolve freely as before.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, June 27.—No. 1710.

SHAW, HENRY.—“ Retarding the velocity of the wheels of  
 “ railway and other carriages when in motion.”

The invention is thus described by the patentee :—“ In place  
 “ of the ordinary break block I propose antifriction wheels of  
 “ metal, wood, or paper, or a proportion of each, and which  
 “ may be buffed with leather or caoutchouc, and which may  
 “ be pressed against the running wheel, the rail, or any part  
 “ of the carriage, and upon the axle of the antifriction wheel  
 “ I place a fly or fan similar to that used in a clock or musical  
 “ box, and which fan may be encased in any suitable way.  
 “ When the train is travelling the antifriction wheels fall  
 “ free of the running wheel, and the progress of the train is  
 “ not interfered with, but when the engine driver requires to  
 “ stop he shuts off steam and applies the engine and tender  
 “ breaks, by which the carriages behind may may run up  
 “ close, and their buffers get compressed. On the buffer rods  
 “ I affix a tooth which turns a cam, and by which a spring  
 “ lever is raised (to which spring lever is attached the  
 “ framing on which the fan axle has its bearing), and the  
 “ antifriction wheel is thus pressed against the periphery or  
 “ other part of the wheel in motion or running wheel of the  
 “ carriage. The antifriction wheel may be toothed or plain.  
 “ To secure a more perfect impingement of the antifriction  
 “ wheel I may use a continuous rod or chain passed along the  
 “ train to assist the closing up together of the carriages and  
 “ which rod or chain may be wound up in the usual manner  
 “ on to the axle of the tender, or on a drum for the purpose.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, June 28.—No. 1718.

FARNWORTH, JOHN KAY.—Windows. A vertical slot or  
 opening is made “ in the inner panel of the carriage door, and

“ the window slides freely in side grooves. To a rail or  
“ frame fixed to the lower side of the glass of the window is  
“ connected a handle or stud passing through the said slot in  
“ the panel of the carriage door; to this handle or stud, or to  
“ another stud fixed to the said rail or frame, is jointed a  
“ catch taking into one or two ratchet racks fixed on one or  
“ both sides of the said slot within the panel of the door.  
“ The catch is held in gear with the rack by a counterweight,  
“ a spring, or otherwise, and when it is desired to lower the  
“ window, the catch (a projection or arm from which extends  
“ through the said slot) is released by hand from the rack. By  
“ this arrangement the window can be opened or closed with  
“ the greatest facility, and when required partially open, the  
“ window remains in the position in which it was when the  
“ hand released the catch.”

[*Printed, 8d. Drawing.*]

A.D. 1865, July 4.—No. 1762.

WRIGHT, STEPHEN.—Axles and axle boxes. These improvements are said to be especially applicable for use with wheels having metallic hubs, as described in the specification of Letters Patent granted to the present inventor, and dated 11th April 1865, No. 1024, and though useful in ordinary cases their application with the particular wheels is mentioned by the patentee.

He says, “I make on the arm of the axle against which the  
“ back end or head of the axle box bears a flange, the face of  
“ which is of a conical figure. Around the base of the said  
“ cone is a tubular or hollow cylindrical shoulder. Upon the  
“ conical face described a washer of leather or india-rubber  
“ is placed. The said conical face constitutes the bearing or  
“ rubbing surface against which the end of the head of the  
“ axle box works. I make the said end or head of the axle  
“ box of a size proper to engage within the tubular shoulder  
“ at the base of the conical face of the flange, and the front or  
“ head of the axle box is made of a hollow conical figure and  
“ fits accurately upon the said conical face. In front of the  
“ conical face on the arm of the axle an annular groove is  
“ made into which oil for lubricating the conical and other  
“ rubbing surfaces of the axle and box is supplied through a

“ hole in the axle box. The said hole is closed by a screw  
“ pin. The arm of the axle is connected to the axle box by  
“ means of the metallic hub of the wheel in the following  
“ manner:—The axle box is made taper, and the metallic hub  
“ of the wheel is fixed thereto by keys or by driving the said  
“ hub forcibly thereon, as described in the specification of  
“ the Patent before referred to. Behind the flange on the  
“ arm from which the conical bearing face is made a loose  
“ disc of metal is situated, and between the back of the  
“ said flange and disc an india-rubber or leather washer is  
“ interposed. Screw pins pass through the said disc and  
“ screw into the metallic hub of the wheel, and thus connect  
“ the arm of the axle to the axle box. In addition to the  
“ connection described of the arm to the axle box a second  
“ connection may be made by passing a pin through the axle  
“ box and making its end work in the annular groove already  
“ described in the arm of the axle. The outer end of the  
“ axle carries a screw nut the inner face of which is conical  
“ and takes a bearing against a conical recess in the end of  
“ the axle box. By making the axle and axle box in the  
“ manner described the rubbing surfaces are reduced, and by  
“ making the rubbing surfaces on the flange of the axle and  
“ axle box conical the said axle box works with great freedom  
“ and steadiness on the axle.”

*[Printed, 8d. Drawing.]*

A.D. 1865, July 4.—No. 1767.

HARRINGTON, JOSIAH.—Two wheeled carriage. “ In con-  
“ structing the bodies of two-wheeled carriages of the descrip-  
“ tion known as Hansom’s carriages where the entrance is  
“ from the front and the driver’s seat at the back ” the  
patentee makes the “ two doors of the full height between the  
“ floor and the roof of the carriage, or nearly so. The roof  
“ is divided into two parts, the hinder part being fixed and  
“ the front part hinged to such hinder part, so that it can,  
“ when desired, fold back thereon; when the front part of  
“ the roof is folded back, and the doors folded back out of the  
“ way, as hereinafter explained, the carriage is an open one,  
“ very similar to an ordinary Hansom’s carriage, but when  
“ the front part of the roof is closed down and the doors shut



“ the carriage is a closed one, and more roomy and convenient  
 “ than a Hansom’s carriage. The front of the carriage is  
 “ formed in three parts; the central part behind the horse is  
 “ fixed, and it rises from the floor to where the front part  
 “ of the roof rests when shut down thereon; this central part  
 “ may, when desired, be formed with a window; on either  
 “ side of this central part is a door which may be hung in  
 “ different ways. In one arrangement the doors are hung on  
 “ radial arms having their centres of motion at the roof and  
 “ on the floor respectively, and they are arranged to move  
 “ behind the central part of the front when opened; or, in  
 “ place of the doors being hung on radiating arms, they may  
 “ be arranged to slide to and from the central part of the  
 “ front of carriage by being suspended from above, or other-  
 “ wise; or the doors may be hinged to the central part and  
 “ fold back behind the same. The body is arranged to be  
 “ hung on springs on an axle and wheels and the shafts are  
 “ applied similarly to an ordinary Hansom’s carriage.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1865, July 8.—No. 1810.

NEWTON, WILLIAM EDWARD. — (*A communication from François Piatti.*)—“ An improved break for retarding the progress of wheel carriages.”

In describing this invention the patentee mentions that not only is “ friction employed for the purpose, but a considerable amount of pressure is applied by means of a foot lever, with which the break or rubbing surface is connected.”

In carrying out this invention “ a lever is adapted to the axletree of the hinder wheels, and is connected thereto by a block or bracket provided with a pin which constitutes the centre of motion of the lever,” the latter being “ formed with an arm which carries the break or shoe,” and which “ rests or bears on the periphery of the running wheel when the lever is forced down,” the weight of the conductor or other person in charge aiding the effect of the break. “ The friction surface of the break may be made of wood or other suitable substances, and is adapted to a moveable plate placed inside the shoe, and provided behind with a screw, whereby it may be forced forward as it wears away.

“ By this arrangement it will be understood that when the friction block is worn out the moveable plate may be removed, and another block be adapted to it, and so on from time to time as the blocks wear away.”

[*Printed, 8d. Drawing.*]

A.D. 1865, July 10.—No. 1821.

BROOMAN, RICHARD ARCHIBALD. — (*A communication from Joseph Alphonse Loubat.*)—(*Provisional protection only.*)—Traction engines or steam carriages. “ Steam carriages constructed according to this invention are distinguished from those hitherto used by the following points:—1st, the power of the engine is transmitted by a chain to the driving axle, which is provided for the purpose with a chain wheel, and is straight instead of being bent or cranked; 2nd, the back wheels are carried by a movable carriage which permits of their turning on a poll bolt; 3rd, steering apparatus is fitted at the front and at the back to guide the carriage according to the curves of the road; 4th, shocks are deadened by caoutchouc packing or springs interposed between the frame of the body and frame which supports the compartments for the passengers or goods. The last named frame is placed over the body frame, and the caoutchouc packing is placed between and around their edges. Gudgeons fitted in the frames, or rods jointed at one end to the upper and at the other end to the lower frame, keep the two frames in the same plane. The driving power is at the front of the carriage.” “ Towards the rear of the carriage is the movable axle carrying two other wheels. On the middle of this axle a disc is fitted, at the centre of which a vertical pivot rises to the centre of a second disc fitted to the upper frame. This arrangement allows of the back carriage turning as on a pivot like the poll bolt of ordinary carriages to follow the curves of the road.

“ The turning is produced by the drivers by means of steering apparatus composed of a hand wheel mounted on a vertical rod, an enlarged part of which receives the ends of two chains; these chains, guided by pulleys, extend and are attached to rings or hooks on each side of the movable axle. According as the driver turns the hand wheel so will the

“ back carriage be directed. A similar steering apparatus  
 “ may be fitted to the rear of the carriage. To allow the  
 “ carriage to run upon rails ” the inventor “ bolts to the tyre  
 “ of each wheel segmental bands, so as to form a flange.  
 “ When the carriage is intended to run on ordinary roads the  
 “ flange is removed. This method of adapting common  
 “ road wheels to railways is applicable both to steam and  
 “ other carriages. The turning of the carriage on a poll  
 “ bolt, as before described, may be produced by gearing and  
 “ an endless screw.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, July 11.—No. 1836.

KEENE, MORRIS HORSEY.—(*A communication from Alexander Keene Richards.*)—“ Improvements in traction engines.” The provisional specification merely relates to the method herein-after described of spudding wheels ; but in the complete specification there is a full description of a traction engine, the principal features of which are that it is driven by gearing, the engine shaft being coupled to the driving shaft by links so that the motion of the vehicle on its springs does not affect the engine ; that each driving wheel may be driven separately ; that trundle wheels are preferred to pinions for gearing ; that dished wheels are preferred ; that the axle is so arranged that it can be turned slightly on its own axis from time to time, to present a fresh wearing surface ; that the spokes of the wheels are secured in recesses in a metal nave ; and that the engine carries a double-purchase crab by means of which it can haul itself out of any difficulty.

The mode of increasing adhesion of the wheels is thus described :—“ In lieu of teeth or blades protruding through  
 “ the felloes and tyre of the wheels, and regulated by a com-  
 “ plicated excentric motion, I apply between the spokes of the  
 “ wheels a rod or bar having a stirrup or fork at the lower  
 “ end, such stirrup being internally of sufficient width to  
 “ embrace the width of the felloes and tyre of the wheel ; the  
 “ external width or width of each side of the stirrup or fork  
 “ may be as required. The rod is set in bearings formed by  
 “ two cross pieces fixed between the spokes, so that the rod  
 “ may slide upwards and downwards, and a powerful helical  
 “ spring is placed around the rod and between the cross

“ pieces. One end of this spring bears on the under surface  
 “ of the cross bar nearest the box of the wheel and the other  
 “ end upon a burr or enlargement of the rod, such burr being  
 “ forced by the spring upon the cross bar nearest the tyre.

“ Now the action of these arrangements is as follows:—

“ While the stirrup blades are free from contact with the  
 “ ground they will project beyond the periphery of the  
 “ wheel, being forced outwards by the springs; but when by  
 “ the rotation of the wheel they come successively into con-  
 “ tact with the ground they are forced inwards against the  
 “ action of the spring, which is made of sufficient strength to  
 “ permit of such motion without affecting the motion of the  
 “ engine on hard ground, and at the same time to keep the  
 “ blades wholly or partially projecting in soft ground, accord-  
 “ ing to its nature, thereby preventing the slip of the wheels.  
 “ On each side of the felloes of the wheels two pieces of angle  
 “ or other iron or metal are bolted so as to form guides for  
 “ the blades or teeth, and relieve the rods from undue strain.  
 “ It will thus be evident that any width of blades may be  
 “ adopted by increasing or decreasing the width of the  
 “ stirrups or forks; whereas in the method of teeth protruding  
 “ through apertures cut in the felloes and tyres the width is  
 “ necessarily limited according to the width of the tyre;  
 “ moreover in such method the wheels are necessarily  
 “ weakened by being so perforated. Although I prefer to  
 “ actuate the blades by a spring I also propose to work them  
 “ with a spring in conjunction with a cam, or by a cam or  
 “ excentric alone.”

[*Printed, 2s. Drawings.*]

A.D. 1865, July 15.—No. 1860.

WALKER, JOHN CRAWFORD.—(*Provisional protection only.*)—  
 Springs.—“ This invention consists in providing for each  
 “ spring an upper and lower cylindrical cast-iron box of suit-  
 “ able dimensions, the lower box being about five inches deep  
 “ and open at the upper end, the upper box being about three  
 “ inches deep and open at the lower end, and being sufficiently  
 “ less in diameter than the lower box to admit of its entering  
 “ freely into the latter, so as to play up and down within it,  
 “ barely touching the inner part thereof. The lower box is  
 “ filled to the depth of three inches or more with old india-

“ rubber springs, or discarded india-rubber of any sort, cut  
 “ into irregular pieces of about half an inch in diameter,  
 “ mixed to prevent solidification with a small quantity of  
 “ hemp or sponge cut into very small pieces; and the upper  
 “ box is filled nearly quite full of wood, or with india-rubber  
 “ or hemp, or some other material; the upper box is then  
 placed with the lower end downwards above the centre and  
 “ within the lower box, the end resting upon the filling of  
 “ the latter. Thus prepared they may be appropriately placed  
 “ as other springs, or, in lieu of other springs, into or upon  
 “ the bolster of the carriage trucks; the lower box may be  
 “ secured in its place by projections from the bottom part  
 “ let into the wood below, or otherwise, as the construction  
 “ of the trucks or bolsters of the trucks may require; and the  
 “ upper box by screws put through its bottom into the wood  
 “ above, or otherwise, according to the construction of the  
 “ carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, July 20.—No. 1892.

SWINBURNE, THOMAS.—“Improved mechanism for propelling, driving, and forcing purposes.”

This invention consists in imparting motion to the shaft to be driven by communicating to it a series of shocks or impulses derived from a rotating flywheel. This flywheel is carried on an axle which slides laterally when required, and thus brings a clutch wheel or lever into gear with the shaft to be driven.

[*Printed, 10d. Drawing.*]

A.D. 1865, July 27.—No. 1951.

CHEFFINS, ALEXANDER. — (*Provisional protection only.*) — Omnibuses. This invention “consists in constructing the  
 “ omnibus with open sides, and a central space between two  
 “ vertical partitions, whereby the lower part of the vehicle  
 “ may be divided on each side into a series of sittings for  
 “ passengers resembling a series of ‘Hansom cabs,’ capable  
 “ of being entered separately through low doors or flaps, and  
 “ the upper part may be fitted with seats on the top with a  
 “ well or space for the feet of outside passengers. The frame

“ of the omnibus is preferred to be constructed of iron in  
“ sheets, united as required by means of angle iron of suitable  
“ sections adapted to the requisite strength of the different  
“ parts. The body of the omnibus is supported by a large  
“ central wheel working in the central space and four smaller  
“ wheels, the front wheels being adapted for turning in the  
“ usual manner. It is intended that the outer sides of the  
“ roof should be supported by hollow brass pillars, fixed one  
“ to each pair of sittings in the lower part of the vehicle, and  
“ that each pair of such sittings should be divided by an arm  
“ or partition, but, these arrangements may be varied.  
“ There is a step extending along each side of the omnibus  
“ for giving access to the whole series of sittings on each side.  
“ The space above the doors may be fitted with curtains or  
“ with glass shutters as usual in cabs of the kind referred to.  
“ The central space at the bottom of the well for the feet of  
“ the outside passengers is covered with perforated metal.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, July 28.—No. 1959.

MITCHELL, ROBERT BRIGHTMORE.—Brake.—The object of this invention is to render the brake self-acting, by utilising the impetus of the vehicle for the purpose. The patentee says, “In attaching my improved break to a carriage for  
“ common roads with more than two wheels, I divide the  
“ carriage from the bed or beds (that is above the turntable  
“ or transit plates) and affix between and thereto one, two, or  
“ more slides or rollers made of suitable strength, materials,  
“ and formation, as the weight, size, and structure of such  
“ vehicle or carriage may require. The one portion of such  
“ slide or roller I bolt, screw, or nail to the body or upper  
“ part of such carriage, and the other part I fasten to the bed  
“ or beds as aforesaid so that one part may have a sliding or  
“ rolling motion upon the other.” “In applying my improved  
“ break on such slides or rollers being fixed, I attach or  
“ hinge the end of the common break ironwork to the under  
“ part of such slides or rollers, or to the bed, instead of the  
“ manner now in practice of fixing them to be worked by the  
“ hand or foot, and therefore, instead of the carriage pressing  
“ upon the motive power, the body contents and the hinder  
“ wheels slip or roll forward upon the slides or rollers and

“ therefore put on the breaks as in case of hand or foot  
“ power. The body and hinder wheels therefore have a  
“ backward and forward motion of the distance required to  
“ work the breaks, but are not allowed to slide or roll to the  
“ full extent of such slides or rollers, as in that case the  
“ power thereby obtained would be lost.” “ In case of a  
“ two-wheeled carriage I fix the break in a similar form,  
“ allowing the body to slide or roll upon the underworks, as  
“ in case of a carriage with more wheels, and thereby so  
“ connect the body with such breaks as to produce the same  
“ effects as aforesaid. In order to counteract the present  
“ effect of the hand or foot breaks in a two-wheeled carriage ;  
“ that is to say, not to place upon the animal drawing the  
“ extra weight caused by the breaks being applied to the  
“ wheels (such weight being caused by the break blocks  
“ having a tendency to be drawn round the wheels, and  
“ thereby lift or pull the weight of the carriage upon the  
“ animal’s back), I place a hand or foot break-work which  
“ shall move the body of the carriage back a short distance  
“ (as far as it shall be needed) before applying the break, and  
“ thereby make the weight upon the animal’s back the same  
“ as before the break was applied.”

[*Printed, 8d. Drawing.*]

A.D. 1865, August 4.—No. 2026.

RANEY, THOMAS STALEY.—(*Provisional protection only.*)—At-  
taching lamp glasses to carriage roofs.—“ For this purpose,  
“ as the glass is placed in position in the roof or other part  
“ of the carriage, a stud or projection or other part of such  
“ glass, or of the frame thereof, passes a spring catch which  
“ prevents the return and consequent removal of the glass  
“ until this catch is released. The axis of this catch is  
“ enlarged into a boss, and it is pierced or has a pin to  
“ receive, or is otherwise formed, to be acted upon by a  
“ key, by which the catch may be turned back or withdrawn  
“ when the glass is desired to be removed, and in order that  
“ both hands may be free to remove the glass at such time,  
“ the key is formed with a stop, which when the key has  
“ acted to withdraw the catch and free the glass may then  
“ hold that catch back to admit of such glass being freely

“ removed. On the withdrawal of the key from the catch that catch is again free to act as a stop.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, August 4.—No. 2028.

BONNEVILLE, HENRI ADRIEN. — (*A communication from Edouard Chollet.—(Provisional protection only.)*)—Axle box.—There is placed in the interior of the box and surrounding the axle, a ring of iron lined with bronze. This ring serves in lieu of the ordinary bearing. It is considerably larger in diameter than the axle and between it and the latter is a roller which rotates on a fixed axis and is properly lubricated. When the vehicle is in movement the axle communicates its movement to the ring, which in its turn rolls round the roller.

[*Printed, 6d. Drawing.*]

A.D. 1865, August 26.—No. 2192.

HAZELDINE, FREDERICK.—Construction of vehicles.—“ This invention consists in substituting wrought iron lattice work or a combination of iron and woodwork on the girder and tension principles, in place of the ordinary wooden framing at present employed in the construction of vans, waggons, or carts, and in covering the roof thereof with corrugated metal (zinc, by preference), also tarpauling, macintosh or other suitable material, and the sides, back and front with mahogany or other wood panelling or boarding, arranged diagonally instead of longitudinally, as commonly practised; and further, in arranging or disposing the rods employed to form the sides of the vans, waggons, or carts, either in parallel lines to each other, or diagonally, upon the tension principle, to the bottom sides of the vans, waggons, or carts.”

[*Printed, 6d. Drawing.*]

A.D. 1865, August 29.—No. 2214.

HOLMES, ROBERT THOMAS.—Releasing runaway horses. The patentee describes his invention in its application to both one or two horse carriages. In the former case he says, I propose to



“ adapt to either one side or the other of the splash board or  
“ guard a lever of the first order; one end of this lever has a  
“ locking bolt or pin attached thereto, the said pin passing  
“ through the perch bolt of the vehicle, which said perch  
“ bolt, for the purposes of this invention, I form hollow; the  
“ aforesaid bolt is intended to project beyond the perch for the  
“ purpose of locking thereto a duplicate futchal, the single  
“ end whereof fits into a socket fixed to the underside of the  
“ perch; the double or forked end of the said futchal receives  
“ the ends of the shafts, which may be connected thereto in  
“ the usual way, the said duplicate futchal being concealed  
“ by being placed underneath the proper or usual futchal.”

The operations of the mechanism are as follows:—

“ The futchal and shafts being connected by the aforesaid  
“ locking bolt to the perch of the vehicle, and maintained in  
“ that position by a strong spring, when it is desired to  
“ detach the horse from the vehicle it is simply necessary to  
“ depress the outer end of the aforesaid lever by the action  
“ of the foot, or it might be depressed by a screw, or other-  
“ wise, the effect of which will be to withdraw the locking  
“ bolt from the hole in the duplicate futchal, thereby  
“ immediately detaching the same and also the horse which  
“ leaves the vehicle with the shafts and duplicate futchal  
“ suspended horizontally by the harness, which are thus  
“ prevented from dangling against the horse’s hocks; simul-  
“ taneously with the disengaging of the horse” a clip which  
is “ attached to the lever, embraces the perch and under  
“ carriage, and thus prevents the vehicle from swerving  
“ sideways.”

“ To adapt this invention to vehicles drawn by two horses,  
“ I propose to employ two sets of levers operating upon pins  
“ or bolts working in guides fixed to the back of the splinter  
“ bar, and secure the ends of the traces thereto by the said  
“ pins or bolts. By depressing the ends of the said levers  
“ the aforesaid pins will be withdrawn, and thus release the  
“ traces, and disengage the horses.” The pole cap is intended  
“ to form a socket and fit easy on the pole, so that when the  
“ traces are released the pole cap will be carried away by  
“ the horses and leave the pole fixed in the splinter bar.’

[*Printed, 8d. Drawing.*]

A.D. 1865, August 30.—No. 2232.

WRIGLEY, THOMAS, and WESTHEAD, MARCUS BROWN.—Windows for carriages. The improvements consist chiefly in “ the use of a disc or roller of india-rubber, or other suitable “ elastic material, having an aperture through its centre, “ which is supplied with a bush or eyelet; through this bush “ a pin or stud is passed for supporting the same, and the “ stud is secured in a bracket attached by screws, or otherwise, “ to the carriage or other framing, in such a position that “ the periphery of the disc or roller shall be in contact with “ and be caused to exert a pressure upon the window or “ framing. Thus, when the window is being raised or “ lowered the said disc or roller will revolve and give a small “ amount of friction, until the window ceases to be supported “ by the hand, at which time the pressure exerted thereupon by “ the india-rubber will retain the window in the position in “ which it was left. The brackets and revolving discs are “ arranged so as to act upon the sliding portion of the “ window, door, or panel when closed, and to counteract “ vibration.”

[*Printed, 8d. Drawing.*]

A.D. 1865, August 30.—No. 2234.

JAMES, SAMUEL LAWRENCE.—(*Provisional protection only.*)—Traction engine, &c. wheels. The inventor constructs “ the “ wheels with teeth, blades, forks, or discs in such manner “ that when it is found that the wheels are striking or “ slipping to one side or the other from the direct line “ desired to be travelled, these teeth, blades, forks, or discs “ are lowered into the ground, thereby obtaining a firm hold “ and preventing the aforesaid slipping or striking, and consequently causing them to hold the engine or vehicle in “ such a position as to enable the driver to steer in any “ required direction. The teeth, blades, or forks are set in “ suitable guides attached to the wheels, and are actuated by “ cams, excentrics, and springs, and by set screws, in order “ to regulate the extent of their projection beyond the “ periphery of the wheel. When it is not necessary to make “ use of these projections the cams or excentrics are turned “ back so as to bring the projections concentric with the

“ wheel, and so present a flush surface to the ground. The  
“ teeth or projections may be of various forms and dimensions,  
“ either as a flat blade on one side of the wheel or as a fork  
“ or stirrup, one blade being on each side of the tyre, or the  
“ blade may penetrate through the felloe and tyre of the wheel  
“ or the fork may be triple-bladed; other forms may of course  
“ be used. In using a disc it may be applied to run loose on  
“ the circular part of the cam frame and secured by a ring  
“ and screws. The projections or discs may be made of cast  
“ or wrought-iron, or a combination of both, or any other  
“ suitable metal.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, August 31.—No. 2242.

GEORGE, WILLIAM.—(*Provisional protection only.*)—Applying springs to two-wheeled carriages. The object of this invention is to prevent excessive jolting of these carriages and the improvement “ consists in jointing the rear end of the shafts  
“ to the fore part of the body of the carriage, or to a rigid  
“ stay or stays attached to the body of the carriage, and  
“ which by preference project a little forward therefrom  
“ horizontally or in a curved line, and in applying to the  
“ under side of each shaft a spring, the lower end of which  
“ is jointed to a stud piece, or small bracket at the lower  
“ end of the stay piece, when a stay piece is used, near the  
“ front of the under side of the body of the carriage; and  
“ the other end may be connected to a bracket or stud piece  
“ immediately below the joint on the rear end of the shaft,  
“ or a little in advance thereof. The spring to be used at the  
“ top is slightly curved backwards, so as to form what may  
“ be called an **OC** spring. When the spring is jointed at  
“ the point immediately below the joint connecting the shaft  
“ to the body or stay piece, a rigid metallic stay is jointed to  
“ about the centre of the under side of the spring, and is  
“ carried forward a short distance in advance of the shaft  
“ joint, and is connected to the under side of the shaft, but  
“ when the spring is attached to the under side of the shaft,  
“ the connecting rod or link is jointed to the upper side of  
“ about the centre of the spring, and is jointed to the rear  
“ end of the shaft in connexion with the body of the carriage,

“ or rigid stay springing therefrom. The springs are so constructed that they will play equally each way, that is to say, both upwards and downwards, and may each consist of a centre spring on the end of which are formed the connecting eyes to receive the joint bolts and elastic or semi-elastic surrounding tubes or packings. One or more scale plates may be fitted on the top and bottom of the centre spring plate. To prevent jarring at the joints, it is proposed to surround the joint pins with a cylinder of vulcanized india-rubber, gutta percha, or suitable substitute therefor for damping the sound which would arise from the jar of the several parts of metal vibrating against each other.”

*[Printed, 4d. No Drawings.]*

A.D. 1865, September 4.—No. 2269.

DRABBLE, JOSEPH.—“Improvements in apparatus used for removing axle boxes from wheels.”

Before describing this invention the patentee mentions that hitherto it has been usual to punch or drive out the axle boxes from the hub or stock with a piece of wood and a sledge hammer by which the axle box was liable to be broken.

According to this invention the wheel is placed in a horizontal position on the ground, as usual, but there is previously introduced into and through the box a stem or mandril, the end of which is provided with a head on which the axle box rests, this stem being made of sufficient length to rise some distance above the stock, so as to receive a hollow metal cap or bonnet having a flange round the lower edge, which is placed in position on the stem so as to rest on the upper end of the stock or hub. Towards the upper end of the stem or bolt a long slot is formed, one half or two thirds of which projects above the crown of the cap or bonnet, a cotter or cotters being inserted into this slot, which cotter or cotters, being of taper form, will, upon being driven by a hammer, exercise a “wedge action,” which tends to raise the stem and draw with it the axle box out of the stock to an extent equal to the length of the slot in the stem below the top of the cap.

Instead of using a cotter or cotters to act as mentioned above, a screw thread may be formed on the upper part of the stem, and a nut be placed thereon which, on being turned by a key will raise the stem and with it the axle box. Collars

are also applied either between the head of the stem and the box, or between the wedges and the cap, "to suit the various sizes of axle boxes, and ensure the proper action of the wedges."

[*Printed, 8d. Drawing.*]

A.D. 1865, September 4.—No. 2271.

MARVAUD, PIERRE.—(*Provisional protection only.*)—Releasing runaway horses. The inventor gives the following summary of his improvements:—"The shafts are so arranged as to be readily detached from the carriage, and for this purpose I cause the ends of the furchels of the fore carriage to be forked, and between the branches is a ratchet or key piece securing the shafts to the furchels by means of a headed spring and a bolt passing through them. In order to unlock the key piece all that is required is to raise a lever arm traversing the fore carriage and the bottom of the vehicle, which causes a cam to press upon the spring freeing the ratchet and bolt simultaneously, the shafts together with the horses are then instantly detached from the vehicle."

"Several means may be employed for freeing the key piece."

Apparatus is also provided whereby "the fore wheels can be directed by the driver as he desires, and thus prevent the carriage coming into collision with anything."

[*Printed, 8d. Drawing.*]

A.D. 1865, September 9.—No. 2319.

PENNINGTON, JOHN.—Opening and closing carriage windows. "For these purposes two toothed racks are used to each window, and the lower ends of these racks are pin-jointed or otherwise attached or fixed to the lower end of the window. The racks move between guides when the window is being opened or closed. Motion is communicated to the two racks simultaneously by means of cog or toothed wheels in the following manner:—On the shaft or axis is fixed a toothed wheel which actuates a cog wheel gearing with the teeth of one of the toothed racks. The toothed wheel on the shaft or axis also gears with an

“ intermediate wheel, and this gears with another toothed  
 “ wheel which gears with the other rack, hence, when the  
 “ shaft or axis is turned round by means of a handle on a  
 “ disc or on a suitable crank fixed to the shaft or axis, the  
 “ rack and consequently the window will be raised or lowered,  
 “ and by friction it is caused to remain in any position to  
 “ which it is raised or lowered.”

[*Printed, 10d. Drawing.*]

A.D. 1865, September 13.—No. 2344.

WOODBURY, JOSEPH PAGE.—“ A locomotive car.”

This invention consists in “ certain improvements in the  
 “ construction of what are known as ‘ dummy engine ’ or  
 “ street steam railway cars or locomotive cars, whereby they  
 “ are enabled to run with perfect ease and freedom round the  
 “ shortest curves that ever occur in any street or other  
 “ railway tracks, and are rendered in various other respects  
 “ superior to any known or used before.”

The invention is set forth at considerable length, but the essential feature thereof consists in dividing the body of the car into two compartments by a partition passing across it, the front compartment being much smaller than the hinder one, and containing or covering the engine and boiler, while the hinder and larger compartment is fitted up in the usual manner for the reception of passengers, the whole car resting upon two trucks each having four wheels, and one truck being placed directly below the engine, while the other is placed near the hinder end of the car. The wheels are all fast upon their axles, and those of the front truck are united also by connecting rods, the power of the engine being exerted upon the axle of one pair of these wheels, but the two pairs of wheels of the hinder truck working independently of each other. That part of the car which contains the engine and boiler has on the under side of its framing a circular track or large ring, and on the front truck is a corresponding track or ring, the forward part of the car resting upon antifriction rollers which are placed between the two tracks or rings. The engine and boiler rest entirely upon the front truck, independent of the body of the car, the actual connections between the car and this truck consisting of a strong bolt or centre pin carried by a stout flat bar projecting from a beam below

the partition which divides the car, the front truck being capable of swivelling upon this pin while the vehicle is passing round a curve in the rails, vertical antifriction rollers being also so arranged as to aid in keeping the parts in their due relative positions, and relieving the centre pin from a portion of the strain which would otherwise be thrown upon it. The hinder truck is also connected to the body of the car by a centre pin, the hinder part of the car resting upon friction rollers placed between tracks or rings, as already mentioned.

The details of the invention are set forth very minutely, but these consist to a great extent of matters connected with engines and boilers, and which are the subjects of other series of abridgments. These details, moreover, may be variously modified, and one arrangement is set forth in which the engine room is circular, and only partially surrounded by the front of the main body of the car thus being capable of turning easily therein. Suitable brakes are applied to the wheels of the vehicle, these being operated by ordinary means, and a "rotary adze cutting wheel" mounted in suitable bearings in front of the engine truck, and driven from the engine, is applied in winter to remove snow or ice from the road or rails.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1865, September 19.—No. 2389.

LLOYD, HENRY.—(*Provisional protection only.*)—Sun shades. The inventor says:—"Sun shades or canopies according to my invention, have stretchers, frames, and coverings, the same as or similar to the like parts of ordinary umbrellas. The centre piece from which the frames radiate in one of my sun shades or canopies is, however, so arranged, that it is made the runner and the centre piece, from which the stretchers radiate, or what is usually known as the runner is made fast to the stem or handle. The stem is secured or attached to the back of the body or other convenient part of the perambulator or wheeled carriage, and in most cases is bent so as to bring the sun shade or canopy which it supports into position to protect the seat part of the vehicle. A joint or hinge is formed in the said stem, or it is provided with a joint or hinge to allow it and the parts thereto con-

“ nected to be neatly folded back when not in use. In the  
 “ said stem and at about the top end thereof is secured a spring  
 “ catch, and near thereto, preferably at the very top, a cord  
 “ or chain is fastened, and is from thence carried through the  
 “ frame’s centre piece outwards to the outside.

“ When it is desired to open the sun shade or canopy, the  
 “ cord or chain is held taut, and pressure applied to the centre  
 “ piece of the frames to cause it to run down the cord or  
 “ chain on to the end of the stem and over the spring catch,  
 “ so as to allow this latter to fix it in the expanded or open  
 “ position. To effect the closing, it is only necessary to  
 “ depress the spring catch, and to allow the frame’s centre  
 “ piece or runner to slide or run back from the stem on the  
 “ cord or chain. It is obvious that the stem may be made  
 “ long enough to project beyond the frame’s centre piece or  
 “ runner when the apparatus is closed.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 5.—No. 2561.

SHAW, ARCHIBALD RICHARD.—Brakes. “ The improved  
 “ brake consists of a shaft with a skid or retarder at each ex-  
 “ tremity to press upon the tyres of the wheels. A lever or  
 “ levers is or are attached to the said shaft, which lever or  
 “ levers is or are drawn by a strap or other connection passing  
 “ along the pole of the vehicle. If applied to a pair-horse  
 “ carriage or along the shafts of a one-horse vehicle, through  
 “ or over a pulley or roller or crank at the forward part of  
 “ the said pole or shafts, and connected with the pole pieces  
 “ or chains, or the breeching of the harness in such manner  
 “ that when the horse holds back in going down hill, or in  
 “ stopping the rope or other connection draws the lever fixed  
 “ to the brake shaft forward, and brings the retarder or re-  
 “ tarders against the wheel or wheels with a pressure varying  
 “ with the momentum of the carriage or the gradient of the  
 “ road. The brake can be fixed in the ordinary way to the  
 “ body of the carriage the connection depending upon the  
 “ kind of carriage. In new carriages the brake may be fixed  
 “ through the eye of the springs either at the front or back  
 “ part, or to the front or back springs, or by strong ironwork  
 “ to the under part of the carriage from the axle or other-



“ wise. The brake blocks are taken off the wheels by means  
“ of a spring acting on the lever, and fixed at any convenient  
“ part of the under carriage.”

[*Printed, 10d. Drawing.*]

A.D. 1865, October 7.—No. 2581.

CRAIG, HENRY GRIFFITH.—Improvements in the construction of vehicles. This invention consists “in the use of steel in  
“ the construction of such parts of railway carriages, waggons,  
“ and trucks, and other road vehicles as are at present made  
“ of wood, iron, or other materials.” Thus the patentee proposes to “construct the bodies, panels, seats, frames, and such  
“ other parts of railway carriages, waggons, and trucks, and  
“ other road vehicles as are now made of wood or iron or other  
“ materials of steel, whereby economy and lightness in construction” are effected; the invention being mentioned as applicable to omnibuses, carts, cabs, broughams, sociables, and chariots, and other conveyances. “Steel in sheets or  
“ plates so applied must be secured by bolts, screws, or other-  
“ wise, the various parts being placed and fitted to each other  
“ by planing, and by other process known in the manufacture  
“ of steel articles.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 11.—No. 2617.

WARBURTON, THOMAS.—(*Provisional protection only.*—Skids or brakes and supports for vehicles. “The improvements consist in the use of a leg beneath each shaft, having a curved  
“ foot which in descending inclines bears upon the ground and  
“ is held in firm contact therewith by means of a forked bar  
“ attached (and exerting pressure upon the leg) to a strong  
“ spring secured to the shaft, when the greatest amount of  
“ friction is required, the whole weight of the cart may be  
“ allowed to act on this forked bar and curved part, the spring  
“ being compressed against the shaft. When not required to act  
“ as a break for the cart or carriage, the leg may be supported  
“ at a slight distance from the ground by means of the forked  
“ bar, in which position it will act as a support for the cart in  
“ the absence of the horse. A second part of the improvements is particularly adapted for heavy waggons, and con-

“ sists in the use of a bracket attached to the lower timbers  
“ thereof, and to which is hinged a curved foot or break,  
“ which is tightened down on the ground by means of a screw  
“ passing through the bracket.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 11.—No. 2623.

DU BOULAY, THOMAS.—(*Letters Patent void for want of Final Specification.*)—Carriage propelled by manual power. “ This  
“ invention has for its object improvements in carriages pro-  
“ pelled by manual power. For these purposes a fore and  
“ hind axle are used, connected by a framing. The fore axle  
“ has a locking motion in order to guide the carriage when in  
“ motion, and the motion to the fore axle is governed by the  
“ feet of the person using and propelling the carriage. On  
“ each axle there are two wheels, the hinder axle is formed  
“ with a crank. The seat is on springs similar to what have  
“ before been used for like carriages. The carriage is pro-  
“ pelled by means of a lever and connecting rod acting on the  
“ cranked axle. The lever has its fulcrum at its lower end,  
“ such fulcrum is supported by a framing below that which  
“ connects the fore and hind axles, and the fulcrum is arranged  
“ to be moved to or from the seat to adjust its position for  
“ different persons. The connecting rod is formed with  
“ several holes at its end in order to admit of its being ad-  
“ justed in attaching it to the lever. The lever is slotted for  
“ some length, where it receives the end of the connecting  
“ rod, and the end of the connecting rod is pin-jointed to the  
“ lever by passing a pin through the lever and through a  
“ hole in the end of the connecting rod, and there are several  
“ holes in the lever in order to admit of adjusting the connect-  
“ ing rod nearer to or further from its fulcrum. At the upper  
“ end of the lever is a cross head or bar, having handles  
“ formed at its ends, and this cross head or bar is arranged to  
“ slide up and down on the upper end of the lever, so that it  
“ may thus be adjusted and retained at any desired height on  
“ the lever. To each of the hinder wheels there is a spring  
“ break, which has a tendency to remain at a distance from  
“ the wheels till they are acted on, so as to press them against  
“ the peripheries of their respective wheels, and this is accom-

“plished by cords, one end of each of which is fixed to the frame of the carriage, and the other end, after having passed partly round a pulley on each of the springs, is attached in a convenient position for the person using the carriage to draw up the cords and so put on the breaks.” In some cases the lever may be acted on by the feet in place of by the hands.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 14.—No. 2659.

STEPHENS, ROBERT.—(*Provisional protection only.*)—Barrow. The inventor shortly describes his invention thus:—“In my improved barrow the handles extend along the outside from the axle of the wheel, gradually rising towards the top at the handle, and by which means the body of the barrow, instead of being above the handles in the usual way, is considerably below them. By this mode of construction I combine the following advantages over barrows now in ordinary use:—Greater power in wheeling, the load being lower and the handles higher; economy of space, as it is one-third less width; greater capacity, as by reason of its being deeper it will carry one-third more material, and much greater strength in construction.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 16.—No. 2668.

HANCOCK, JAMES LAMB.—Wheels and tires. The patentee in describing his invention says, “I surround the nave of wooden wheels, which may be considerably reduced in consequence of the extra strength which my construction imparts to it, with a ring or plating of iron or other metal with apertures for the passage of the inner ends of the spokes into the nave. I construct tyres in the form of a shoe, that is, with a flange in each side, within which the felloe is received. I make these double-flanged tyres in one or more pieces. When of one piece I unite the ends, forming apertures in them, and bring them together by a cramp, and secure the ends by pins or keys. Should the tyre after wear require to be tightened, I then drive larger pins or keys into holes provided for the purpose in the tyre. In

“ some cases I form the tyre with one flange only, and bolt  
 “ on a ring through the felloe and to the flange, the felloe  
 “ being held between the flange and the ring. I secure the  
 “ inner ends of the spokes to the felloe by forming a longi-  
 “ tudinal tenon in the spoke, which enters a corresponding  
 “ mortice in the direction of the grain of the wood of the  
 “ felloe. In some cases I use single or double-flanged shoes  
 “ and shrink an outer tyre in them. In such case I form  
 “ them with another flange depending from the inner or outer  
 “ side to a less extent than the thickness of the outer tyre to  
 “ be applied. The shoes may then be comparatively light.  
 “ Among other advantages this method of construction affords  
 “ ready means of re-tyring the whole wheels when required.

“ I construct machinery for the bending of double or single  
 “ flanged tyres, which consists of an expanding and contract-  
 “ ing segmental core, on the edge of which the inside of the  
 “ tyre rests, while the flanges overlap on each side; I then  
 “ apply rollers in sets of three, one for the outer surface and  
 “ the other two for the flanged surfaces of the tyre, or I use  
 “ one roller with depending flanges. I impart rotary motion  
 “ to the segmental core or to the rollers. The heated tyre is  
 “ bent round and the flanges are kept true; the ends are not  
 “ united. When cool the core is contracted and the tyre is  
 “ removed.”

[*Printed, 8d. Drawing.*]

A.D. 1865, October 18.—No. 2687.

ROCK, JAMES.—(*Provisional protection only.*)—Carriage hoods, springs, and brakes. The first part of the invention relates to a method of applying springs to the hoods of carriages to facilitate raising and lowering the same. The inventor says  
 “ I place these springs, made of any convenient shape, so  
 “ that the moving parts of the head press or rest upon them  
 “ when lowered, the springs thus counterbalancing the  
 “ weight of those parts, and giving them a tendency to rise.  
 “ Second, in making springs for carriages of triangular, ellip-  
 “ tical, or semi-elliptical form in such manner that the  
 “ strongest part of the springs shall be at the part farthest  
 “ from the points of support and of attachment to the weight  
 “ to be supported, contrary to the method hitherto followed.

“ Third, in making breaks for retarding the motion of  
“ carriages in such manner that they may be applied by a  
“ person sitting on the near side of the coach box, or either  
“ by such person or by the coachman; in the latter case two  
“ handles or levers are provided, one on each side of the car-  
“ riage, and the horizontal connecting rods by which the  
“ handles act upon the retarders are jointed, so that when one  
“ handle is used and its connecting rod drawn straight, the  
“ connecting rod on the other side drops by its own weight  
“ out of the straight line at the part where jointed, and thus  
“ offers no impediment to the use of the break. A spring or  
“ springs is or are attached to the break rods or shafts to  
“ throw the retarders off the wheels when the handle is  
“ released by the person using it. I also sometimes make  
“ retarders to act both before and behind the wheels of the  
“ carriage at the same time; in this case I make the rods or  
“ levers carrying the hind retarders to work in slides fixed to  
“ the framing of the carriage, and connect them with the  
“ front retarders by means of connecting rods, so as to be  
“ applied or thrown off at the same time and by the same  
“ handle or handles as before described.”

*[Printed, 4d. No Drawings.]*

A.D. 1865, October 20.—No. 2708.

ROWE, SAMUEL RICHARD.—Wheels. “ In connecting or  
“ jointing the felloes according to my invention,” says the  
patentee, “ I expand or make a shoulder on the end of each  
“ spoke, so as to make the spokes act as supports to the felloes  
“ instead of only passing through them, and I joint the  
“ felloes over every alternate spoke instead of between the  
“ spokes, as is usual. The joint of the felloes is formed by  
“ one half of the end of the spoke being passed through one  
“ felloe and the other half of the spoke through the other  
“ felloe. The expanded end of every alternate spoke of the  
“ wheel thus serves as a bearing or support to the joints of  
“ the felloes, and renders it impossible for the wheel to lose  
“ its circular shape or for the felloes to be broken by pressure  
“ over the joint. After the felloes have been jointed in the  
“ manner described they are ready to receive the tyre which  
“ is shrunk upon them in the ordinary way.

“ Although I prefer to joint the felloes over every alternate  
“ spoke yet the jointing may be effected over every first and  
“ fourth spoke, or over every spoke. My improvement may  
“ be applied to wheels made either of wood or iron.”

[*Printed, 6d. Drawing.*]

A.D. 1865, November 1.—No. 2816.

FARNWORTH, JOHN KAY.—Raising and lowering windows. This invention “ consists in an improved arrangement of parts  
“ for opening, closing, and retaining in the desired position ”  
carriage “ windows.” In carrying out the invention the patentee applies a ratchet rack to each side or edge of the window, “ with the horizontal part of the teeth upwards, and  
“ catches in the frame of the window, one to take into each  
“ rack; these catches are released from the racks simul-  
“ taneously by a double lever or tumbler actuated by a handle  
“ and cords, bands, or chains, or by other suitable means.  
“ The window is counterweighted by a preponderating weight  
“ or weights, consequently as soon as the catches are disen-  
“ gaged from the racks, the window will open or close as  
“ desired, according to the purpose for which the fittings  
“ have been specially applied,” or the racks and catches may  
be applied to windows which are not counterbalanced, and  
raised in the usual manner, or in the manner described in the  
specification of the patent granted to the present patentee on  
the 28th of June 1865, No. 1718, such windows being allowed  
to drop by their own gravity when the catches are released  
from the racks. The latter may be furnished with grooves,  
these working upon beads or tongues in the frame of the  
carriage door, and this arrangement preventing the window  
from rattling, or such grooves and tongues or beads may be  
dispensed with. Or the racks may be grooved on the reverse  
side, and the glass of the window be fitted into such grooves,  
the racks being fastened at the lower ends to a rail of wood  
which works “ up and down the interior of the panel of the  
“ door invisibly,” the usual window frame being thus dis-  
pensed with, the glass only in this case being visible.

[*Printed, 8d. Drawing.*]

A.D. 1865, November 4.—No. 2848.

BRETT, WILLIAM. — Barrow. “The improved truck or barrow which constitutes this invention consists of a hollow semi-cylindrical shaped holder, the sides and bottom or periphery of which are made of plates or hoops of iron, between which plates and hoops respectively, both at the sides and bottom, openings of about one inch in width more or less are left. The object of these openings is to cause the heated mass of gas coke, furnace cinders, or other hot material to be acted upon by the external atmosphere and be more rapidly cooled, thus lessening its injurious effect on the holder. This holder, which forms the body of the truck or barrow, is mounted upon two standards of a cranked axle, the latter being supported on travelling wheels. The cranked axle is fixed to a frame to which a shaft or handle is fitted for moving the whole. The holder can be tipped upon its own axis (which is independent of that of the wheels) while both frame and wheels remain stationary. It can also be turned over bottom upwards or nearly so by raising the shaft of the travelling frame.”

[*Printed, 8d. Drawing.*]

A.D. 1865, November 9.—No. 2890.

AVY, JOSEPH ERNEST.—Indicator for carriages. This indicator is intended to show the time occupied in the paying travel of the vehicle. The apparatus for this purpose is thus described:—“A slight chain is made to pass beneath the carriage, and the ends are respectively secured, one at the back of the carriage, and the other to a crank shaft concealed and working in bearings beneath the coachman’s box; this chain is acted upon by two metal rods which pass through the bottom of the carriage and are in connection with the seats, which are slightly raised on springs it follows that on a passenger seating himself the seat sinks, depressing the rods, and so tenses the chain, which dragging on the crank shaft above mentioned causes it to complete about half a revolution; connected with this crank at each extremity is an indicator or dial piece bearing the word ‘hired’ on one side of the carriage, in addition to this is a small barrel-spring clock, which instead of having hands is

“ furnished with a thin cardboard or paper dial divided into  
 “ twelve hours; when the carriage is unoccupied this card  
 “ dial is pierced and held in its position by a small pin or  
 “ stop-piece which is governed by the indicator. Directly a  
 “ seat is taken the chain is tensed, the crank drawn down,  
 “ the effect of which is to raise the indicator and bring into  
 “ view the word ‘hired,’ this movement of the indicator  
 “ draws back the stop-piece or small pin above mentioned,  
 “ and the card dial being thus free commences to turn round,  
 “ fulfilling the duty of the hour hand of the clock, the time  
 “ being marked by the first puncture to the second puncture,  
 “ the latter being made by the driver turning back, by means  
 “ of a key or other contrivance, the crank shaft to its old  
 “ position on the passenger abandoning his seat, by which  
 “ the indicator moving back the word hired is concealed and  
 “ the small pin or stop-piece is pressed through the card, thus  
 “ defining the length of time the carriage has been hired by  
 “ a second puncture.”

[*Printed, 10d. Drawing.*]

A.D. 1865, November 14.—No. 2927.

WILLIAMSON, JOSEPH, LINDLEY, JAMES, and COLEMAN,  
 JAMES.—Brakes. This invention consists in the employment  
 of a rod or rods placed in or beneath the framing of a railway  
 or other carriage in bearings in which such rod or rods may  
 partly revolve. “Each rod is provided with one or more  
 “ arms, to which is hinged one end of a lever, having its  
 “ other end hinged or otherwise attached to one end of  
 “ another lever, to the other end of which last named lever are  
 “ attached the ends of two straps, whose opposite ends are  
 “ hinged or attached together, and work upon a pin or axle  
 “ lying in a bearing secured to or forming part of the under  
 “ framing of the carriage or vehicle. These two straps have  
 “ upon their inner sides friction blocks, so secured to them  
 “ that when worn they may be readily replaced by fresh  
 “ blocks; the straps and friction blocks are placed upon the  
 “ circumference of a drum or pulley keyed or otherwise  
 “ secured fast upon one or all of the axles of each pair of  
 “ wheels of the carriage or other vehicle. There may be one  
 “ drum on the axle of each pair of wheels, or two drums on  
 “ each axle, in which case there would be two rods and



“ levers ; in either case, however, the rods are arranged to  
“ operate upon the straps and friction blocks in such manner  
“ that when a hand lever or an equivalent contrivance is  
“ moved slightly to the right or left (according to the way in  
“ which it is arranged to act) such blocks will embrace the  
“ drum and prevent the revolution of the wheels, so as  
“ effectually to stop the running of the carriages or vehicles  
“ either on the level or on an incline. A spring catch and  
“ lever are conveniently placed to act in such manner that  
“ the rod which carries the first named lever will be held in  
“ either of the positions in which it is placed. Each of the  
“ above-named partly revolving rods is provided at either or  
“ both ends, in addition to the usual coupling chains and  
“ draw bar, with a reversible swivelled coupling, in order  
“ that a carriage or vehicle may be removed from a number  
“ of carriages or vehicles and the remainder of them con-  
“ nected together or attached to each other as safely as if it  
“ had not been so removed.”

[*Printed, 2s. 10d. Drawings.*]

A.D. 1865, December 2.—No. 3100.

NICOLE, ADOLPHE.—(*Provisional protection only.*)—Endless tracks for carriages. “ This invention has for its object improvements in carriages and endless tracks on and with which they run. For these purposes when a carriage is to be drawn by shafts the body of the carriage is constructed and arranged in a frame which is mounted on wheels of comparatively small diameter and it is preferred that there should be three pairs of wheels and three axles. Two pairs of the wheels are on axes below the body of the carriage, and one pair of the wheels ” is “ on an axis above or at the upper part of the body of the carriage. The wheels are grooved or have flanges on each side so as to insure their being retained on the two circular elastic tracks or continuous rails within and on which the carriage wheels move, and the carriage derives all the necessary spring and elasticity from the circular elastic tracks in place of having springs between the axles and the body of the carriage. There are usually two of such elastic circular rings or endless rails or tracks, one on each side of the carriage,

“ and they are of steel. In carriages with long bodies more  
 “ than three pairs of wheels and more than two circular  
 “ elastic tracks or endless rails may be employed. The  
 “ circular elastic tracks or endless rails run on the road in  
 “ place of the carriage wheels, whilst the carriage wheels run  
 “ on and within these circular elastic tracks, the object being  
 “ that these circular elastic tracks should reduce the draft by  
 “ acting as wheels of large diameter and at the same time  
 “ offer the requisite elasticity or spring to the body of the  
 “ carriage, and thus admit of the ordinary springs between  
 “ the axles and body of a carriage being dispensed with.  
 “ When a carriage is to be propelled by steam or other power  
 “ in the carriage, in such cases the axle of one or more pairs  
 “ of wheels of the carriage are to receive motion from such  
 “ power, and the wheels in place of being plain are to be  
 “ formed with teeth or projections to enter holes or against  
 “ projections formed in or on the interior of the elastic cir-  
 “ cular tracks.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, December 7.—No. 3150.

RUSSELL, GEORGE FITZJAMES.—Hoods, aprons, and dashes of carriages. Instead of using leather for the above purposes, the patentee proposes “ to apply a fabric of silk, which will  
 “ be found not only sufficiently waterproof to exclude rain,  
 “ but will also form a very light and elegant appearance to  
 “ the hood of the carriage. The hinged or jointed skeleton  
 “ iron frames of the hood will also be made much lighter,  
 “ and thus the weight of the carriage or vehicle will be con-  
 “ siderably reduced. The apron should have a border and  
 “ lining of strengthening fabric, and the hood may be also  
 “ lined for the sake of affording strength and protection to  
 “ the silk ; so also with the dashes or splash boards the same  
 “ principle is to be applied.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, December 12.—No. 3210.

SOVEREIGN, LEVI LEMON.—(*Provisional protection only.*)—Naves and axle boxes. “ The nave is of cast metal, having  
 “ hollows at intervals around it to receive the inner ends of

“ the spokes. At each end of the nave is formed a cavity or  
 “ hollow chamber to receive the lubricating fluid ; the cavity  
 “ or hollow chamber at the inner end is open at the centre  
 “ for the passage of the axle. The cavity or hollow chamber  
 “ at the outer end of the nave is open at the centre, but when  
 “ in use is covered by a cap. The central part of the nave  
 “ where it receives the axletree within it is bushed with a  
 “ steel cylinder or tube, and this bush or box is fixed and held  
 “ within the nave either by a screw thread formed on its  
 “ outer surface, which is received into a female screw formed  
 “ on the interior of the nave, or the steel bush or box is  
 “ formed with a projecting rib or feather, which fits into a  
 “ groove in the nave, or the arrangement of the rib or feather  
 “ and groove may be reversed, and if desired more than one  
 “ rib or feather may be used. In place of the bush or box  
 “ being of steel it may be of chill cast iron with a screw  
 “ thread on the outside, and generally ” it is preferred “ that  
 “ this form of box or bush should be somewhat conical.  
 “ When the steel bushing or box is screwed outside it is  
 “ retained from turning when in use by notches formed in  
 “ the inner end, into which are received projections or  
 “ holding pieces in the nave, which are kept in position by  
 “ the end of the axle. The axletree is retained in position  
 “ within the steel or chill cast bush or box by a screw nut or  
 “ nuts at its outer end, together with a pin or pins in the  
 “ usual manner, and when using ribs and grooves as above  
 “ explained a screw ring or washer is used to retain the bush  
 “ or box from movement.

“ When using wooden axles and wooden naves to the wheels  
 “ the metal box is chill cast with webs or feathers to fix into  
 “ the centre of a wooden nave, and each end of the wood  
 “ axle is covered by a chill cast thimble with a male screw at  
 “ its outer end to receive a screw nut and cap to close the end  
 “ of the box and to retain the axletree in the box.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, December 14.—No. 3227.

DOBBS, ARCHIBALD EDWARD.—(*Provisional protection only.*)—  
 Drag or skid. “ The improvement consists in attaching skids  
 “ or drag shoes to carriages in such a way that they may be

“ slipped under the wheels when wanted, and released and  
“ carried into place ready for use again without backing or  
“ stopping the carriages.

“ A skid is attached to one end of a bar, having its other  
“ end enlarged, and an opening in the enlarged part through  
“ which the axle tree passes so made that the skid can be  
“ moved round the tire of the wheel at different distances  
“ from the tire. The distance is regulated either by the  
“ opening aforesaid working on a cam, or by a pin in the bar  
“ moving in a cam-shaped groove or against a curved spring,  
“ by passing along which the pin is guided. If necessary, a  
“ toothed wheel upon the nave holds a catch on the above-  
“ mentioned bar, and carries the skid round the wheel into  
“ place. When the skid is not in use it is held in front of the  
“ wheel by a detent connected with the carriage, and on the  
“ said detent being moved it slips under the wheel, and a piece  
“ proceeding from it is caught by the same detent and the  
“ wheel locked. On the detent being moved again the skid is  
“ released and carried round the wheel into place.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, December 23.—No. 3328.

DWYER, EDMUND, and MOON, HENRY.—Propelling by hydraulic power. The carriage may “ have three or more  
“ wheels. Two or more of the wheels may be flanged externally for running upon the internal surface of larger  
“ wheels or ‘annulars’ as hereafter described, and have  
“ cranked axles, and be capable of acting independently of  
“ each other. On the carriage should be fixed two or more  
“ driving cylinders.” “ These cylinders may have a piston  
“ fitted to each with a double rod, the bottom piston rod to  
“ be connected with the plunger rod of a double-action pump,  
“ and the top rod of each piston to be connected to the connecting rod of the corresponding crank axle. The machine should  
“ have two or more large wheels, by preference made of iron,  
“ around the inner circumference of which wheels are formed  
“ and arranged a number of small cylinders or boxes made of  
“ any suitable metal having pistons or plungers, the tops of  
“ which form rails upon which the internal wheels are supported  
“ and roll.” “ The cylinders respectively belonging to each  
“ quarter of the wheel are made to communicate with each

“ other by means of pipes, one end of each pipe having a valve opening into the interior of each cylinder or box. The nave of each large wheel is so constructed as to form a cylinder with a diaphragm or vertical partition in the centre. The nave may be fixed to the wheel by means of four or more solid or hollow iron or steel spokes dished or inclined outwards, so as to allow the nave to project beyond the plane of the outer surface of the wheel. Each quarter of the wheel should have two hollow spokes to form pipes communicating from the nave to the cylinders in the periphery of the same wheel. The cylinders of one quarter of the wheel have no communication with the cylinders of the remaining quarters except through the nave, each pair of pipes communicating with the opposite sides of the naves alternately. In each pair of pipes there should be placed valves, one pipe being for the down connexion from the nave to the cylinders of the wheel, and the other pipe a rising main to convey the fluid upwards from the cylinders to the nave, and from thence to the motive power or driving cylinders as before mentioned, and which are placed on the carriage, the down pipe having a slide valve, and the rising main a spindle or other suitable valve or valves, with a connecting rod or pipe from the piston in the rising main to the slide in the down pipe. Each of the large wheels should have a hollow shaft having stop ends, the axles to be grooved for packing, and to have shoulders at one end to rest in sockets fixed at each end of the nave to prevent the axle touching the bottom of the same. The axles will form fixed pistons, which are held in the framing of the carriage, the inside axles having cranked arms at their ends; the axles of the larger wheels to rest on the carriage, but not directly sustaining any of its weight. The axles are to have stand pipes which lead to cylinders, and also to the pumps on the carriage.” “The supply pipes from the nave to the motive power or driving cylinder on the carriage are employed to convey the fluid from the sides of the nave to the ends of the driving cylinders alternately, and the supply from the double action pumps also on the carriage to the nave acting on alternate sides thereof.” “The motion is produced by the cranked axle wheels being placed on the rails formed by the tops of the pistons or plungers belong-

“ ing to the boxes or cylinders fixed on the large wheels  
 “ and kept in position by the flanges on the cranked axle  
 “ wheels. The whole or part of the weight of the carriage  
 “ being thus placed on the cylinders or boxes after being first  
 “ charged press down the pistons or plungers and force out  
 “ the fluid which can only pass through the rising main, and  
 “ from thence to the cylinder on the carriage, driving down  
 “ the pistons thereof, and causing the cranked axles and  
 “ flanged wheels to revolve and thus produce the motion  
 “ required.”

[*Printed, 1s. Drawing.*]

A.D. 1865, December 23.—No. 3334.

HURN, GEORGE, and HURN, DANIEL.—Cutting leather into continuous lengths. After the skin has been properly prepared and trimmed it is cut by causing the knife to “traverse  
 “ the entire surface of the skin so as to divide it into an end-  
 “ less piece or coil.” This is afterwards straightened and stretched, rolled or otherwise prepared.

Such leather may be used for various purposes connected with carriages, such as trimmings, lacings, aprons, dashes, panels, covers, &c.

[*Printed, 8d. Drawing.*]

A.D. 1865, December 26.—No. 3336.

LONES, ELIAS, LONES, JOSEPH CONSTANT, LONES, JOHN, BRETTELL, JOHN, BRETTELL, THOMAS, and VERNON, CHARLES.—Making collars and shoulders of axles. The “im-  
 “ provements in the manufacture of collars, consist, firstly,  
 “ in taking a bar of iron of the diameter which the collar of  
 “ the axle is intended to have, and by passing it through  
 “ rolling machinery, reducing the diameter of the iron on  
 “ either side a portion left of the original diameter to consti-  
 “ tute the collar. The ends of the bar are then properly  
 “ shaped.” “Secondly, in making of the ring of the size of  
 “ the required collar, and taking a bar of iron of the diameter  
 “ of the back collar of the axle, and welding the said ring  
 “ thereon.”

The “improvements in making the shoulders or back and  
 “ front collars of axles and spindles, consist in forming the said

“ shoulders by means of ordinary rolls, having grooves and  
“ recesses made in them of a size and shape proper to roll  
“ down or reduce the diameter of the iron passed through  
“ them, leaving at the proper place a portion of the iron of  
“ sufficient diameter to form the shoulder.”

The “improvements in machinery to be employed in the  
“ manufacture of axles and spindles are as follows:—The  
“ machinery by which the collars of the axles and spindles”  
are made “consists of three rolls, two of the said rolls being  
“ in the same horizontal plane, and driven from the same  
“ toothed wheel. The said rolls have rotation in the same  
“ direction, and the portions of the said rolls opposed to each  
“ other consequently move in opposite directions. Above  
“ these two rolls is a third roll. The bar of iron operated  
“ upon is put between the three rolls from the ends of the  
“ rolls, its axis being parallel with the axes of the rolls. The  
“ said rolls have grooves in them of the size and shape  
“ required to produce the reduction of the bar on either side  
“ the part left for the collar. During the action of the rolls,  
“ the bar operated upon is retained between them and made  
“ to perform rotary motion, during which by the pressure of  
“ the said rolls it is brought to the required shape. The  
“ motion of the top roll is produced by the rotary motion  
“ communicated to the bar operated upon by the lower  
“ rolls.”

“ The machinery by which a collar separately made is  
“ welded to the axle is similar to that last described, excepting  
“ that the rolls are provided with grooves suitable to compress  
“ and weld the collar on the shoulder or back collar of the  
“ axle. The rolls by which the shoulders or front and back  
“ collars of the axles are formed are geared together by  
“ means of gearing consisting of two disks or plates situated  
“ face to face on the ends of the driving shaft and the shaft of  
“ one of the rolls respectively, screw pins passed through  
“ these plates connect them together. The holes in one of  
“ the said plates are circular and of the size of the screw  
“ pins, and those in the other are elongated so as to form  
“ curved slots. By this arrangement the plates can be turned  
“ upon one another and adjusted before fixing with the  
“ greatest nicety, and the recesses in the rolls made accurately  
“ to coincide with one another. The improvements in the

“ coupling of the machinery last described may be applied to  
 “ the coupling of rolls for other purposes, and to the coupling  
 “ of shafts and axles generally. The ends of the bars on  
 “ which collars have been formed or welded, are shaped by  
 “ means of rolls having grooves in them of the size and  
 “ shape proper to give the required form and size to the said  
 “ ends of the bars.”

[*Printed, 10d. Drawing.*]

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A.D. 1866, January 6.—No. 50.

DE MESNIL, OSCAR, Baron.—(*Provisional protection only.*)—  
 Towing boats and propelling vehicles. The greater part of  
 the description contained in this specification, has relation to  
 various methods of rope towing or propulsion on rivers.  
 After explaining so much of his invention, the inventor  
 adds, “ This part of my invention is also applicable to the  
 “ traction of vehicles on rail or tramways or on common  
 “ roads. Along the middle or side of the road or railway I  
 “ lay down a wire cable extending as far as the vehicles are  
 “ intended to travel, and at each end I attach the said cable  
 “ to suitable fixtures and support it when necessary by posts,  
 “ rollers, or by other suitable means. I connect the said  
 “ cable with Fowler’s clip pulley before referred to affixed to  
 “ a driving shaft working in suitable bearings in a car or  
 “ carriage, which said car or carriage is provided with a port-  
 “ able or other steam engine, or an engine actuated by air or  
 “ gas, to give motion to the said driving shaft and pulley,  
 “ which by pulling on the cable causes the car to advance.  
 “ The said drum or pulley may be placed either in the centre  
 “ of the car or at the side thereof, and may be either hori-  
 “ zontal or vertical, and when a variation of speed is required  
 “ two or more said pulleys of different diameters may be used  
 “ as hereinbefore described in respect of my improvements in  
 “ towing boats.”

[*Printed, 4d. No Drawings.*]



A.D. 1866, January 16.—No. 145.

DUMMERE, STEPHEN. — (*Provisional protection only.*)—Dry seating for vehicles, &c. “This invention is designed to prevent the inconvenience and injury to health arising from wetting the couch. It consists of a recess, made of japanned tin or other suitable material, let into a portion of the palliasse below as a receptacle, and immediately above such receptacle, a corresponding portion of the mattress is covered with a waterproof material, distributed over the surface of which are a suitable number of perforations to convey the liquid at once through the mattress, which is thus always kept perfectly dry. By the use of metal or other eyelet holes, which indent the surface of the said mattress in the manner of tufts in stuffing sofas or chairs, any liquid must immediately fall through the eyelet holes into the pan in the palliasse beneath, and can be removed at pleasure.

“Further, this invention is designed for ensuring dry seating on omnibuses, public or private conveyances, steam and pleasure boats, or any other places exposed to wet by weather or otherwise, and having no level or absorbent surface always to be self-draining.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, January 24.—No. 229.

EVANS, JAMES WILLIAM. — Spring cases. This invention consists in the construction of metallic cases or shells to receive spiral springs and elastic substances for railway carriages, waggons, and other vehicles, to be used for bearing and journal springs, draw and buffer springs. The outer part or case is made of a series of half cylinders with moveable interior pieces, with corresponding half cylinders, constituting together a cylinder or cylinders, to prevent the spirals and elastic substances from deviating from a straight line, and to reduce the length of the spring without the reduction of motion. Also to place a ‘case’ of cylinders containing the spirals or elastic substances on each side of the journal boxes, being united by a metallic bridge or yoke. Upon the side of each case or shell facing the journal box a recess is made to receive and retain hard india-rubber or

“ other elastic substance, constituting the clip or sides of the  
 “ seat of the said spring, and which bears upon the journal  
 “ boxes, and thereby to obviate and prevent injury to the said  
 “ case of springs from shunting or other sudden concussion  
 “ to the carriages or other vehicles and also to cause easy  
 “ curving. In the parts in which the ends of the spirals rest  
 “ recesses are made the depth of the thickness of the metal  
 “ used and formed to fit the unground ends of the spirals.

“ These improvements relate to the employment for the  
 “ purposes herein mentioned of ‘spiral springs’ filled with  
 “ wool or other fibrous material as patented by Perry Green  
 “ Gardiner, December 1st 1863, and numbered 3307.”

[*Printed, 10d. Drawing.*]

A.D. 1866, January 29.—No. 277.

DE WITTE, GERARD.—(*Provisional protection only.*)—Brake.  
 This brake is intended to be worked by the backing of the  
 horses. “ An iron bar is placed beneath the pole of the  
 “ carriage, such bar being capable of moving longitudinally  
 “ in guides, and acting upon a cross or transverse bar or  
 “ shaft, to which the break blocks are attached. The forward  
 “ end of the said longitudinal bar is connected with the  
 “ harness of the horses or other animals.” “ The other end  
 “ of the said bar articulated by means of a segment or plate  
 “ or other analogous contrivance to a corresponding segment  
 “ or plate or other analogous contrivance attached to the end  
 “ of a longitudinal bar or shaft, which latter carries at the  
 “ other end thereof the before mentioned transverse bar or  
 “ shaft to which the break blocks are attached. The said last  
 “ mentioned segment or plate is provided with a slot, through  
 “ which passes a pin fixed by any suitable arrangements to  
 “ the carriage, and upon which pin the said segment or plate  
 “ will freely turn. Upon the recoil of the longitudinal bar ”  
 “ the break blocks carried by the before-mentioned transverse  
 “ bar will be pressed against the tyre or peripheries of the  
 “ hind wheels, such pressure being equally imparted to both  
 “ wheels, whatever may be the position of the front carriage,  
 “ by reason of the articulation by which the longitudinal bar  
 “ beneath the pole is connected with the shaft carrying the  
 “ transverse bar and break blocks as before mentioned, and  
 “ by which the pressure is carried in a direct line and in an

“ equal degree to the break blocks. A spring is fixed to the  
 “ hind carriage of the vehicle, by means of which the trans-  
 “ verse bar and break blocks are restored to their normal  
 “ position immediately the backward pressure ceases. By  
 “ the use of a system of levers” “ additional break blocks  
 “ may be applied to the opposite portions of the tyres or  
 “ peripheries of the wheels, and actuated by the arrangements  
 “ before described. In order to prevent the break blocks  
 “ being applied to the wheels when it is not desirable that  
 “ such should be the case an arrangement is employed by  
 “ which the mechanism is placed entirely under the control  
 “ of the driver of the vehicle.” “ In order to prevent the  
 “ break blocks being liable to displacement by the pressure  
 “ of the wheels” “ they are tapered that is to say, are made  
 “ of less transverse diameter at the bottom than at the top,  
 “ so that the pressure of the wheels is calculated to retain  
 “ them in the block holders attached to the before-mentioned  
 “ transverse bar, and in which they are fitted and held by  
 “ corresponding dovetails, all necessity for bolts or screws  
 “ being thus dispensed with.”

*[Printed, 4d. No Drawings.]*

A.D. 1866, February 7.—No. 369.

SCOTT, URIAH.—“ Improvements in various parts of railway  
 “ and other carriages.”

This invention relates, firstly, to “ making adjusting and  
 “ check springs combined.” A metal plate is fixed to the  
 frame of the carriage, and a second plate to the top of the  
 bearing spring, blocks of india-rubber being combined with  
 these plates, one block being between them and the other on  
 the top of the plate attached to the carriage frame, a bolt  
 passing through both plates and blocks.

Secondly, to buffers. A case fixed to one carriage contains  
 cylindrical blocks of india-rubber combined with rings of  
 metal, a wedge-shaped plunger upon the next carriage being  
 driven, in case of collision, into the case containing the india-  
 rubber; a metallic lining preventing the plunger from cutting  
 the india-rubber when so driven in.

Thirdly, to constructing wheels of metal or wood, or both,  
 combined with india-rubber, felt, or other suitable material.  
 India-rubber is in one case placed between the nave and a ring

which receives the inner ends of wooden spokes. In another case a tire is formed of india-rubber with a metal ring inside it. In another case the outside tire of a railway wheel has india-rubber between it and an inner rim; and in other cases india-rubber is placed around the bolts which secure the tire in its place.

Fourthly, to making railway and other axles of metal combined with india-rubber, felt, or other suitable material. A railway axle is set forth as being composed of an inner shaft having upon it a tube of india-rubber, there being upon this, again, a tube of metal for the reception of the wheels. And an axle for carriages for common roads is described in which a square tube of india-rubber on the axle is surrounded by a square tube of metal to which the carriage spring is attached.

Fifthly, to making springs for railway and other carriages of steel and iron, in combination with india-rubber, felt, wood, leather, or other suitable material. In one case two steel plates have their ends secured in an outside cap, india-rubber being placed between the under parts of the plates inside the cap and a wedge-shaped piece of metal into which a screw is passed from the outer end of the cap. In another case a tube of india-rubber surrounds a cylindrical piece of metal, the ends of steel spring plates partially surrounding the india-rubber. In another case a C spring is composed of steel plates, connected by an india-rubber or leather brace with a metal frame having "elastic sockets for bolts to work in."

Sixthly, to making body, spring, and brake bearings and shackles of metal combined with india-rubber, felt or other suitable material, such india-rubber or other material being combined with plates of metal in different modes. "These bearings can be used to isolate break blocks in railway and common road carriages, and also the axlebox from the axle guard and the springs from axles." A shackle is described in which an outside oval case of metal is lined with felt or india-rubber, metal bearings being placed inside the lining.

Seventhly, to causing carriage steps to open and shut by the action of the door, which is effected by means of a bent lever, one end of which is connected with the carriage door, and the other with a sliding socket from which a second lever proceeds to the step frame, a projection from the back of the

step carrying a small wheel causing the apparatus to "send" the step into the frame" when the door is closed. A modification is described as being applicable to a "ladder" step."

Eighthly, to a fluted reflector for lamps, which does not require notice here.

Ninthly, to keeping carriage and other windows in any required position, and to preventing windows and doors from rattling, this being effected by means of a shaft having at the outer end a small wheel, and pressed in one direction by a spring, the whole being enclosed in a suitable socket.

Tenthly, to rollers for the window blinds of carriages, this part of the invention consisting essentially of a small wheel which is constantly pressed by means of a spring upon the cord which passes over the roller pulley thus causing the blind to remain in any position desired. A spring hinge "to assist" in closing the doors of carriages" is also mentioned, in which a block of india-rubber is compressed by a bolt between two metal washers in such a manner as to produce the required effect.

[*Printed, 10d. Drawing.*]

A.D. 1866, February 7.—No. 370.

PRICE, EDWARD.—Barrow. The patentee thus describes his invention:—"My improved barrow, cart, truck, or other vehicle is mounted on an axletree and two wheels. The body is constructed in two parts, the part next the handles or shafts being fixed to the frame, while the other or front part is, by the contrivance mentioned below, made capable of being turned nearly bottom upwards, so as to leave an opening at the bottom of the vehicle through which the load is discharged. I propose to make this moveable or front part to work on hinges or joints formed by bolts passing through eyes made with flaps, and fastened on each side of both parts of the vehicle at the top directly over the axletree. The part intended to work on the hinges is in the form of a quadrant at the bottom; and is raised by means of a bar of iron attached to it horizontally at the top on the right side, forming a lever, the fulcrum of which is at a point near the right hinge, to which lever at the end

“ nearest the shaft is joined a handle made to double upon  
“ the lever and lie on it when not in use, but to be raised into  
“ a position nearly at right angles with the lever when about  
“ to be used, and within reach of the man working it, who by  
“ pulling the handle towards him with a downward pressure  
“ operates upon the lever, raises the front part of the vehicle,  
“ and forms the opening at the bottom to rid it of its load.  
“ In order to facilitate the discharge of the load the bottom  
“ of the back part next the shaft is made to slope from the  
“ top of the frame to the point of discharge, so that when the  
“ separation of the parts takes place the load falls out easily  
“ of its own gravity.

“ By the above improvements the weight of the load is made  
“ to rest on the axletree, and when the vehicle is fairly filled  
“ will balance on it.”

[*Printed, 8d. Drawing.*]

A.D. 1866, February 9.—No. 404.

ROCK, JAMES, the younger.—Heads and springs for carriages. This invention consists, firstly, “in applying springs made  
“ of steel, india-rubber, or other suitable material, either  
“ separately or in connection with hinges or joints, to the  
“ heads or coverings of landaus and other carriages and  
“ waggons made to open and shut (whether such carriages  
“ or waggons be used for the conveyance of passengers or  
“ goods on common roads or on railroads) for the purpose of  
“ raising or closing such heads, or coverings, or assisting to  
“ raise or close them, and whether such raising or closing be  
“ done simply by hand or with the aid of weights, levers,  
“ screws, or other machinery.” These springs may be made  
of any convenient shape, and so placed that the moving parts  
of the heads or coverings draw, press, or rest upon them  
when lowered, “the springs thus counterbalancing the weight  
“ of those parts and giving them a tendency to rise when  
“ required.” Certain handles, holders, pulls, or tassels are  
connected with the middle or other hoop sticks of the head, by  
which persons inside the vehicle may easily raise such head,  
the latter being then held up by means of props and certain  
framework or levers combined therewith, one arrangement  
being mentioned in which by a cross bar passing under the  
seat of a carriage, and certain levers, the weight of persons on

the seat may be made available for raising the head. Weights may if desirable be used instead of or along with springs.

Another part of the invention consists in making carriage springs of triangular, elliptical, or semi-elliptical form "in such manner that the strongest part of the springs shall be at the part farthest from the points of support and of attachment to the weight to be supported contrary to the method hitherto followed." An arrangement of this kind is described as being adapted to the hinder part of a carriage for common roads.

[*Printed, 8d. Drawing.*]

A.D. 1866, February 9.--No. 409.

RUSSELL, GEORGE FITZJAMES. — Wheels. This invention is applicable to the wheels of various carriages, the principal object of the invention being to make a wheel which may be "put together or taken apart in a short space of time," every part fitting accurately when fastened. The patentee proposes to construct the spokes of such form "that their edges at the stock or nave of the wheel shall register together, their surfaces forming radii of a circle, their outer ends entering the felloes and having shoulders thereon, thus limiting the extent of their penetration into felloes, and affording a bearing between the surface of the shoulder and the felloe. The felloes are made each with a projection at one end, and a recess at the other, so that when fitted together they fasten each other. The tyre is grooved or slotted on its internal periphery in order to receive the corresponding outer surfaces of the felloes, and prevent them from escaping laterally."

"In order to put the wheel together the felloes are first placed in the tyre, and then the spokes are inserted in the felloes and made to register at the nave, instead of being inserted into mortices in a stock as by the ordinary plan, then two semi-stocks (one on each side) are applied to the spokes, and tightened up by means of screw pins and nuts." The axle is secured in its position by means of a recess formed therein, and semicircular collars which fit into this recess and into the interior of the outer portion of the stock, these collars being compressed by a metallic cap screwed on the nave. In

order to effect a more perfect tightening up of the stock and spokes, a layer or layers of gutta percha, india-rubber, or leather may be applied between them.

“It will be seen that there is no shrinking of the tyre upon the felloes, neither are any bolts required to fasten the tyre to the felloes but the entire wheel when made in pieces may be put together and fastened up ready for immediate use.”

The details of the invention may be variously modified.

[*Printed, 8d. Drawing.*]

A.D. 1866, February 16.—No. 492.

GEDGE, WILLIAM EDWARD.—(*A communication from Désiré Massé.*)—(*Provisional protection only.*)—Cart. In order to facilitate loading, the body of the cart is so contrived that it may be lowered to the ground and raised again as occasion may require. For this purpose screws pass through the axletree and these screws are made to rotate by gearing worked by cranks and so raise or lower the body. The bottom of the cart is divided into doors which open and shut to facilitate unloading. They are held closed by a system of catches and springs.

[*Printed, 10d. Drawings.*]

A.D. 1866, February 20.—No. 526.

WINBY, CLIFFORD ETCHES, and WINBY, FREDERICK CHARLES.—(*Provisional protection only.*)—Wheels. The inventors thus describe so much of their improvements as relate to the construction of wheels generally:—“In forming the parts represented by the spokes of discs of metal the peripheries of which are rivetted one on each side of an inner rib or flange formed on the internal tyre, or it may be the tyre itself, while the centre parts are rivetted on each side of a cylindrical body or flange projected from the nave or boss. This cylindrical body or flange, which is of considerable thickness, instead of being formed on a nave or boss fixed to the axle, we sometimes forge on the axle itself, and this forms one part of our invention. In order to strengthen and stiffen the discs we dish them so that the central parts are further apart than their peripheries, and we further form a series of cup-like indentations arranged round the centre ;



“ the convex sides of these indentations come together, and  
“ we rivet the discs together at those points. A rim may be  
“ thrown outwards on the discs and slightly bevilled, so that  
“ the tyre being undercut a little and shrunk on the discs  
“ they will have additional lateral security besides that of the  
“ bolts or rivets. Instead of rivets as before-mentioned bolts  
“ may be used.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, February 26.—No. 586.

EDWARDS, THOMAS, the younger, and INIFF, SAMUEL.—(*Provisional protection only.*)—Passenger register or indicator. “ In  
“ applying this invention to, say, an omnibus one of the steps  
“ is jointed at the edge nearest to the vehicle by a rule or any  
“ other convenient joint, so that it may deflect on its outer edge,  
“ say, about a quarter of an inch, when pressed down by the  
“ weight of the person stepping upon it. On one side of the  
“ inner edge of this step or platform is secured a rigid arm  
“ of metal parallel to the edge of the step or platform, but  
“ enclosed within a casing on one side of the step. Near the  
“ front on the under side of the deflecting step or platform is  
“ secured a small lateral arm, which projects within the casing  
“ and is provided with a small vertical pillar to which the  
“ horizontal arm parallel with the step or platform is jointed  
“ for insuring the stability to the horizontal lever. The outer  
“ end of the horizontal lever carries a vertical rod, to the  
“ head of which is jointed a second vertical rod working  
“ through a guide eye or eyes, and on the top of which is  
“ placed a small inverted loose metal cup which acts against a  
“ small gong or bell secured to the inside of the casing, and  
“ on one side of the upper vertical rod (a little distance below  
“ the loose metal cup) is jointed a small horizontal beam,  
“ which works on a transverse axle, having its bearings  
“ within a frame containing a train of indice wheels resem-  
“ bling those of an ordinary gas meter, and which train of  
“ wheels are provided with pointers travelling over suitably  
“ graduated dials in front of the frame and in rear of an  
“ opening in the side of the case, which may be glazed and  
“ fitted with a door which may be locked to prevent improper  
“ access to the apparatus. The short horizontal beam jointed

“ to the vertical reciprocating rod has at the outer end jointed  
 “ thereto a pendant pawl, which is slightly weighted at the  
 “ back and takes into pawl teeth formed on a ratchet wheel  
 “ on the first motion shaft on the train of indice wheels. The  
 “ platform or step is kept up when not weighted by the person  
 “ passing over it by a buffer or other convenient spring placed  
 “ beneath it, or by means of a draw spring.”

“ When this invention is applied to public wheeled carriages  
 “ it will be observed that the tell-tale will be acted upon by  
 “ the passenger entering and leaving the vehicle, in which  
 “ case the apparatus will register double, or the dials may be so  
 “ graduated as to require the double action on the foot board  
 “ to advance the pointer one division.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, February 27.—No. 605.

COLE, MAURICE. — (*Provisional protection only.*)—Cab. The inventor says, “ I build the cab after the pattern of the Han-  
 “ som so far as the outline is concerned, but I divide it longi-  
 “ tudinally or make it double bodied, so as to leave a free  
 “ space under the roof of the cab to receive the horse, the seats  
 “ for the passengers will thus be on either side instead of as  
 “ heretofore behind the horse. The axle is cranked at its  
 “ ends which are fitted with wheels of the ordinary diameter ;  
 “ it is also bent at its middle so as to form an arch over the  
 “ back of the horse. The cab I provide both at back and  
 “ front with shoes a few inches from the ground, the former  
 “ to prevent the horse from rearing and throwing the cab  
 “ backwards, and the latter to prevent the horse from falling.  
 “ This arrangement of cab protects the body of the horse  
 “ from the weather, but leaves his head and legs free for  
 “ action. In order to harness the horse to this cab, which  
 “ has no shafts, the arch of the axle is fitted with a vertical  
 “ screw pin, which passes through the axle and enters a  
 “ tapped hole in a plate rivetted to the iron tree of the ordi-  
 “ nary pad. Projecting from the upper part of the axle is a  
 “ steel arm, which is secured by a removeable cross pin to the  
 “ head of the hames. Short draught traces attached to the  
 “ hames are secured to the axle, and breech traces are also  
 “ secured in like manner. The bridle and reins will require

“ no change except that the latter will lead under the roof to  
“ the driver at the back of the cab.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, March 3.—No. 644.

FRIEND, JOHN WALTER. — “Improvements in two wheel  
“ vehicles.”

This invention has reference to a method of “equalizing  
“ the draught and weight of the carriage upon the back of  
“ the horse, by which an uniform and self-adjusting balance  
“ is obtained and brought into action when ascending or  
“ descending inclines or gradients upon the road, and consists  
“ in mounting the under-framing (to which the body is  
“ attached) upon semi-elliptic side springs secured to the  
“ axle with their ends extending outwards in contact with  
“ the lower surface of the under framing, in such manner  
“ that the said ends thereof (fitted with friction rollers) are  
“ caused to work freely within channel bearings cut or formed  
“ in the same and arranged so as to expand or slide outwards  
“ when actuated by the motion of the carriage, stud pins  
“ working within slide slots on each side of the channel  
“ grooves being also employed for confining the ends of the  
“ springs in their reacting position upon the friction rollers  
“ aforesaid, so that on ascending or descending an incline the  
“ body of the cart may be enabled to glide backwards or  
“ forwards on the ends of the springs to the full extent of the  
“ slots, thereby obtaining in connection with a draw bar fixed  
“ to the centre of the axle and splinter bar of the carriage,  
“ and provided with a screw nut for regulating and adjust-  
“ ing the balance or set of the cart upon the wheels, an  
“ easier and more agreeable running motion on the road than  
“ by the employment of scroll irons and couplings as at  
“ present.”

[*Printed, 8d. Drawing.*]

A.D. 1866, March 3.—No. 657.

BISCHOFF, JOHN.—(*A communication from Robert Creuzbaur.*)  
—Improvements in steam “cultivators, parts of which im-  
“ provements are applicable to traction engines and to port-  
“ able engines used for other purposes.”

“The steam carriage frame is supported by the principal  
 “ axle with its two side wheels and by a third wheel in front,  
 “ which at the same time serves as a guide or steering wheel.  
 “ When turning round a corner, one of the side wheels can  
 “ be disengaged by means of a clutch box. Between the axle  
 “ of the side wheels and the steering wheels is placed a  
 “ vertical boiler, to the upper part of which is attached the  
 “ inverted steam cylinder with valves and piston rod, and also  
 “ a smaller steam cylinder whose object will be hereafter  
 “ explained. A connecting rod connects as usual the steam  
 “ cylinder with the crank or main shaft, which latter is  
 “ placed in the middle between the two side frames and reaches  
 “ to the rear of the carriage, where it communicates motion  
 “ by means of two bevil wheels to the vertical shaft of the  
 “ central horizontal rotating cultivator.” After describing  
 the application of the cultivator the patentee continues:  
 “ The machine must have the capacity of varying its speed,  
 “ and it is also desirable to be able to go backwards with the  
 “ machine as well as forward; this is accomplished as fol-  
 “ lows:—On the crank shaft are placed two bevil pinions  
 “ turning loose upon the shaft within suitable collars;  
 “ between these pinions is placed a double clutch box moving  
 “ in a key and key groove. A bevil wheel keyed on a short  
 “ horizontal shaft gears into the two pinions and on the same  
 “ short shaft are keyed a spear wheel and pinion, which gear  
 “ respectively into a carrier pinion and into a wheel, both of  
 “ which turn loose on a countershaft. The former again gears  
 “ into a wheel turning loose on the carriage axle, and the  
 “ latter has a pinion cast to it which likewise gears into a  
 “ wheel loose on the carriage axle. A third and fourth loose  
 “ pinion on the countershaft gear into two corresponding  
 “ wheels keyed fast on the carriage axle. By means of the  
 “ wheel and pinion on the first named short shaft, and the  
 “ corresponding wheels on the countershaft, two different  
 “ speeds can be given to the countershaft, and by bringing  
 “ the several loose and fast wheels on the carriage axle into or  
 “ out of action by means of clutch boxes, two different speeds  
 “ can be given to the carriage axle and wheels by each of  
 “ them, or in all eight different speeds.”

The boiler “is a vertical cylindrical boiler with spherical  
 “ top, a number of large tubes each fitted with an inner tube

“ of smaller bore reach from the top of the fire-box downwards  
“ into the fire space. The object of the inner tubes is to cause  
“ a circulation of the water down through the small tubes,  
“ and upwards around the small tubes, through the large  
“ tubes to the water above the top of the fire box, in the  
“ manner now well known. From the fire-box a number of  
“ flue pipes disposed in a circle, pass through the water and  
“ steam space to a chamber formed by a spherical covering  
“ above the spherical top of the boiler, and to which spherical  
“ covering the funnel is attached.

“ The boiler and the spherical casing already mentioned is  
“ surrounded and covered by a double jacket or casing forming  
“ an inner and an outer air space and on the top of the boiler ;  
“ these two casings form an inner and an outer cylindrical box  
“ in which is placed on a vertical spindle a fan with obliquely  
“ set blades. The escape steam from the cylinders passes  
“ into a large circular tube placed horizontally round the top  
“ of the boiler between the inner and outer jacket, and  
“ a number of smaller tubes fixed into this tube reach  
“ down between the inner and outer jacket, and dip with  
“ their open ends into the feed water which encircles the  
“ lower part of the boiler. When the fan driven from the  
“ crank shaft is in motion cold air is drawn in at the lower  
“ end of the outer casing, and this cold air passing all around  
“ the small vertical tubes will become partially heated and at  
“ the same time cause a portion of the steam in the said tubes  
“ to condense and run into the feed water. The air is drawn  
“ over the edge of the inner casing into the cylindrical fan  
“ box, and by the fan it is forced down between the inner  
“ casing and the boiler and into the furnace above and below  
“ the grate bars. The fan is loose on its spindle, and when  
“ the speed of the engine is increasing the fan rises, and by  
“ doing so raises the shorter arms of the two levers, one of  
“ which is connected with the throttle valve of the steam pipe  
“ and the other with a damper in the funnel. The fan there-  
“ fore serves the triple purpose of condensing the escape  
“ steam and converting it into feed water, of supplying hot  
“ blast to the furnace, and, finally, of regulating the speed of  
“ the engine.”

[Printed, 2s. 6d. Drawings.]

A.D. 1866, March 9.—No. 725.

HADLEY, BENJAMIN.—(*Provisional protection only.*)—Springs. The following is this provisional specification:—"My improvements consist in arranging and adapting helical springs for the use of road carriages, which springs I purpose making invariably of a coiled rod or strip of steel, the section of which is rectangular, that is to say, its width being about double its thickness, more or less, as preferred; this section affords great strength and resistance with economy of material. They may be set up singly or in pairs, taking their bearing on a suitable connection with the axle in connection with guide sockets or rods, and a stay plate or parts attached to the carriage body. And in some instances for carriages requiring to run low, the same description of springs may be suitably attached to the carriage axles so as to hang pendant, the body of the carriage attached to their lower ends, by which means the spring will be exerted in its expansion in contradistinction to its compression."

[*Printed, 4d. No Drawings.*]

A.D. 1866, March 10.—No. 740.

ASHBERRY, PHILIP HENRY.—Manufacturing and ornamenting articles of Britannia metal. The patentee thus describes his invention which "relates to certain improvements in the manufacture of articles usually made in Britannia metal or pewter, by which means harder alloy of metal may be used than is capable of being used by the present system of manufacturing the same. Also, the ornamentation of articles in the above metals, and in combination therewith and other suitable metals applicable to the ornamentation of furniture, houses, and other buildings, handles of cutlery, covers of books, carriages, chandeliers, &c. The alloy which I prefer to use (but I do not limit myself to this mixture) I propose to call 'Ashberrium.' It is composed of tin, 80 parts; antimony, 14 parts; copper, 2 parts; nickel, 2 parts; aluminium, 1 part; zinc, 1 part; melted together in the usual manner. For common articles I add lead in proportion to the quality of the article desired to be manufactured. I force the molten metal or alloy into the mould to cast the desired article or

“ part of an article either by means of a force-pump or by the  
“ force of its own gravity.”

“ The manner in which I ornament articles usually made in  
“ Britannia metal, pewter, German or nickel silver, and silver,  
“ and which is also applicable in combination with these and  
“ other suitable metals, for the ornamentation of . . . car-  
“ riages, is as follows :—I fill ornamental crevices made in  
“ the article itself or a separate piece soldered or fastened to  
“ it, with a coloured composition, to imitate enamelling and  
“ inlaid work.

“ The composition which I use is formed by mixing the  
“ desired colour (in fine powder) with copal varnish until a  
“ stiff paste is formed ; with this I fill the crevices, and then  
“ put the article in a stove to dry ; when dry I rub the sur-  
“ face smooth with Trent sand and sweet oil, and polish off  
“ with rottenstone and oil. In some cases it is preferable to  
“ use a composition formed by mixing the color (in fine  
“ powder) with superfine plaster of Paris in water, filling the  
“ crevices as before, drying, and then varnishing with a  
“ mixture composed by melting two parts resin in one part  
“ boiled linseed oil, and finishing as before.”

“ In those parts of articles which are usually made in  
“ Britannia metal, pewter, German or nickel silver, and silver)  
“ which have to be handled, I prefer to make of thin copper,  
“ and enamel them all over with a vitreous enamel by the  
“ usual method of effecting the same ; or make them of papier  
“ maché by pressing it into the desired shape by means of  
“ dies, and afterwards enamelling or japanning by the usual  
“ process ; or make them of vulcanized india-rubber by  
“ pressing it into moulds to form the desired shape, and  
“ afterwards polishing by the usual process.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, March 19.—No. 813.

OSBORNE, CHARLES STANLEY.—Composition for lining axle  
boxes, bearings, &c. This composition consists of a mixture  
of “ parksine,” or gun cotton and vegetable oil, and plumbago,  
steatite, and sometimes sulphur. Fibrous material, such as  
cotton, is incorporated to give toughness.

[*Printed, 4d. No Drawings.*]

A.D. 1866, March 24.—No. 877.

JOHNSTON, THOMAS, and RENNIE, THOMAS WILSON.—Wheels and tramways. “This invention has for its object  
“improvements in arranging or combining the wheels and  
“trams or ways for carriages on common roads. For these  
“purposes one of the trams or rails of a line of tramway, on  
“a common road is formed with a narrow groove towards  
“one edge, whilst the other part of the rail or tram is flat  
“and is to receive the flat or plain part of the tyre of each  
“wheel on one side of the tram carriages which are to run  
“on the line. The flange of each wheel on that side of the  
“tramway carriages enters the narrow groove in the rail or  
“tram, and the carriages are thereby guided along the line.  
“The other rail of the line is flat, and such is the case in  
“respect of the surface of the tyres of the wheels on the other  
“side of the tram carriages which run thereon, such wheels  
“having no flanges. By this arrangement or combination  
“the tram carriages are guided and retained by only one rail  
“or tram. Carriages with ordinary wheels or wheels without  
“flanges may run with freedom on the lines, and also cross  
“the lines without shock owing to the narrowness of the  
“groove in the grooved rail or tram.”

[*Printed, 8d. Drawing.*]

A.D. 1866, March 26.—No. 886.

RICHARDSON, JAMES, and TAIT, JOHN.—(*Provisional protection only.*)—Brakes for railway and other carriages. According to this invention each axle of a railway or other carriage is provided with a right and a left volute or scroll cam, one of which is meant to be used when the carriage is travelling in one direction and the other when such carriage is moving in the reverse direction. The brakes themselves are of the ordinary character and are provided with links, duplex levers, and cross shafts for actuating them in the usual manner, except that upon each cross shaft two longitudinal levers are placed, the free ends of which are capable of moving transversely and horizontally over the ends of the volutes or cams, so as to be brought into contact with them and removed therefrom at pleasure, these operations being effected by various mechanical means, one of which consists in placing a light



longitudinal shaft below the centre of each carriage, which is made to act upon the free ends of the levers, when turned partially round on its bearings, through the medium of lateral links or rods, ratchet or toothed racks and wheels, and other mechanism. The longitudinal shaft of one carriage is connected with that of another by "quarter lap" couplings or other simple joints, or by forming each shaft in two parts connected by a "spring box." The result of these arrangements is that an attendant by turning one of the longitudinal shafts of a train, may bring one lever of each carriage over its proper cam, according to the direction in which the train is moving, each cam then gradually raising its lever and so applying the brakes. In place of the longitudinal shafts being made to act upon the levers through the medium of links and racks and gearing, as mentioned above, they may be made to operate upon them by means of duplex levers, one end of each being moved by a short screw barrel upon the longitudinal shaft, or by a spring which is allowed to act by the movement of a tooth or vane on the shaft. The levers may be removed out of contact with the scroll cams by slightly backing the train, or by chains proceeding from winding barrels on the longitudinal shafts all of which arrangements may be variously modified, as well as the arrangement of the scroll cams themselves and the levers upon which they act, the details of the invention being set forth at very considerable length.

[*Printed, 4d. No Drawings.*]

A.D. 1866, April 6.—No. 989.

DE GABLENZ, ANTOINE, Baron.—(*Provisional protection only.*)  
—"Antifriction bearings." The object of this invention is to reduce the friction attendant upon the usual mode of arranging the axles and shafts of carriages and machinery, and the invention consists in so constructing the bearing that the axle or shaft "is not subjected to any direct friction," this being accomplished "by furnishing that part of the shaft or axle " that is usually laid down in bearings with a ring or collar, " the circumferential surface of which may be either convex " or concave, and bearing respectively upon a projecting ring " or a groove upon or in a circular moveable plate connected


“ with a corresponding stationary plate by means of a central stud or pin. Between these two plates a number of anti-friction balls or spheres, held at a proper distance apart by a corresponding number of radial arms mounted upon a central pivot, are inserted for the transmission of the rolling motion and reduction of the friction.”

Different modifications of the invention are described, the invention being mentioned in particular as supplying a substitute “ for the axle boxes commonly in use in railway carriages, locomotives, and for other similar purposes.”

[*Printed, 6d. Drawing.*]

A.D. 1866, April 18.—No. 1089.

PUCKERING, ROBERT.—Locking wheels. This invention relates “ to what is known as the ‘ forelock ’ in four wheeled vehicles for common roads, and has for its object the shortening of the coupling of the front and hind wheels, and the obtainment of a larger bearing when turned in the lock.

“ In carrying out this invention it is proposed to employ two iron transome plates, one of which may be faced with hard wood on the rubbing surface to prevent jarring and noise in running. The two front parts of the transome plate form the ordinary half circle, and the lower plate is provided or formed with a longitudinal slotted bar, or long spindle, or solid bar extending from the crown of the half circle to its centre. In this slot or along this longitudinal bar slides a bolt or eye attached to the upper transome plate. The back part of the lower transome plate, the form of which constitutes the essential feature of my invention, is shaped so as to form a double reverse curve, thus, , and is either slotted so as to admit of a bolt or pin attached to the top carriage part or upper plate sliding therein when locking, or it may be made solid and have a raised lip or rib extending along the under surface of the bar so far as the outer edge of the ‘ futchels,’ and on each side or edge of this plate or bar there is a bolt carried by the upper plate having a laterally projecting lip which underlaps the curved bar of the lower transome plate, the lips of the bolts bearing against opposite sides of the raised

“ lip or rib on the bar, and thus guide the lower transome  
“ plate when in the act of locking.”

[*Printed, 8d. Drawing.*]

A.D. 1866, April 18.—No. 1094.

EDWARDS, WILLIAM YOUNG.—(*Provisional protection only.*)—  
Axles and axleboxes. “According to one arrangement, the  
“ ends of the axles are ribbed or fluted in the direction of the  
“ length thereof, these fluted or ribbed ends of the axles are  
“ placed within boxes which are free to run within the hubs  
“ or boxes of the wheels; the interior of these loose boxes is  
“ smooth, whilst the exterior is ribbed or corrugated as  
“ described with respect to the axles. Or the axles, which  
“ are ribbed or fluted as above described, may work within  
“ the hub or box of the wheel without the interposition of a  
“ separate box as above described. Another arrangement  
“ consists in the application of rollers working between the  
“ axles and the interior of the hub or box of the wheel, such  
“ rollers may be loose within the hub or box of the wheel, or  
“ they may be kept at suitable distances apart by working in  
“ suitable bearings.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, April 30.—No. 1215.

DAVIES, GEORGE.—(*A communication from Isaac Merritt Singer.*)—“Improvements in or applicable to carriages.”

This invention relates, firstly, to a method of mechanical driving. The reins are held between friction rollers in such a manner as to secure a “steady pull” on the horses, and by means of a hand lever or a disc worked by the feet the horses are guided through the reins, as required.

The invention secondly consists “in making the axletrees  
“ in two parts and coupling them together at the centre by  
“ the following means:—Flanges are formed upon the inner  
“ ends of the two parts which come together (say) from four  
“ to six times the diameter of the axle. In the centre of one  
“ flange a shallow hole is formed, and from the centre of the  
“ other projects a pin, the end of which rests in the hole of  
“ the other flange, but is prevented from touching the bottom  
“ of the hole by the thickness of a ring of india-rubber which

“ is inserted between the flanges. Four bolts are made to pass through both flanges and through the india-rubber, so as to connect the two parts of the axletree together, but the bolts must fit loosely in the holes so as not to prevent the couplings from yielding, as the object of this part of the invention is to allow the coupling to yield to any obstruction that the wheels may encounter, or the same kind of couplings may be placed between the outer edge of the spring and the inner surface of the nave of the wheel, in which case there will be two couplings to each axle.

“The third part of the invention consists in placing on the axletree of the carriage (or in an equivalent position) near the nave of the wheel a piece of metal or other suitable substance having projecting arms of a sufficient length and placed in such positions as to support a guard projecting over the tire of the wheel above and around the wheel as far forwards and backwards as may be deemed necessary to prevent the mud and dirt from being thrown from the periphery of the wheel.”

“The fourth part of this invention consists in attaching a guard to the ends of the carriage shafts in such manner that it will be impossible for the reins to catch around the ends of the shafts. The guard is in the form of a loop made of a light piece of iron, one end of which is fastened to the upper part of the front end of the shaft; the piece is then lowered or curved round, and its other end fastened to the under side of the shaft some distance from the end, the bow of the loop projecting forwards and outwards.”

[*Printed, 1s. Drawing.*]

A.D. 1866, May 2.—No. 1250.

BRIERLEY, RICHARD.—(*Provisional protection only.*)—“Improvements in carts, wagons, lorries, or any such like vehicles.”

The following is the inventor's provisional specification:—  
“My invention relates to the so arranging the frame and body of a cart, wagon, or lorry, that loads of any weight or bulk up to three tons may be easily drawn with one horse and unloaded with considerable less power and inconvenience than is usually required. To effect this purpose I use three or four wheels as convenience may dictate, the

“ fore wheel or wheels will be made to work under the frame  
“ and swivel on a plate or otherwise, in the ordinary Dobin  
“ wheel manner; these are placed under the frame connected  
“ to the shafts and the axle of the hind wheels; these hind  
“ wheels I make large in diameter, say seven feet, and  
“ equivalently broad to support the load without injuring the  
“ roads. I do not confine myself to any particular size of  
“ wheels as I may and shall vary such wheels according to  
“ the size and use of the vehicle. To the axle of the hind  
“ wheels I hinge the body in the ordinary way for tilting to  
“ unload, the tilting apparatus will consist of one or two  
“ quadrants, with slide brackets on the side of the body for  
“ quadrants to work in; in the inside or on the outside of  
“ such quadrants teeth are made to form a rack, into which  
“ I work a pinion for tilting. Thus it will be seen that  
“ I get the capacity of a wagon body with all the con-  
“ veniences of unloading of a cart, and by my high wheels  
“ three tons will be drawn with the same facility as half the  
“ weight with the ordinary vehicle; suitable breaks will be  
“ applied to the wheels when going down hills for regulating  
“ the speed with greater facility than can be done with ordi-  
“ nary carts.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, May 4.—No. 1273.

WALKER, JOHN, and WARNER, ARTHUR.—(*Provisional protection only.*)—“Improvements in compressing cotton or other  
“ light materials into trucks or wagons for transit upon rail-  
“ ways or other roads.”

According to this invention “rolls or drums are fixed on  
“ the ends of the trucks or wagons, so that by the aid of  
“ chains worked by levers the cotton or other light compres-  
“ sible materials may be compressed into a comparatively  
“ small space. At each end of the truck or wagon there is  
“ a frame of suitable strength corresponding in size with the  
“ ends of the truck, wagon, or other carriage,” to which the  
improvements are to be applied, and on this frame are  
mounted two horizontal shafts, one along the top and the  
other at the bottom, there being on each of these shafts two  
or more hollow rolls or barrels, capable of turning freely

thereon. Across the centre of each frame is mounted another shaft, having thereon fixed drums or barrels corresponding with those on the top and bottom shafts, this shaft revolving freely in suitable bearings, and having on each end a ratchet wheel in gear with which is a pall mounted on the outside of the truck or wagon. This shaft may be caused to rotate by means of other palls which are made to act upon the ratchet wheels by means of levers, or by other suitable mechanism.

“ At the end of each fixed drum or barrel the end of a chain  
 “ or rope is fixed, one of which passes under the bottom roller  
 “ and along inside the bottom of the truck, the other end  
 “ being made fast to a follower inside the truck; the other  
 “ chain or rope passes over the top roller, and is fastened to  
 “ the top of the said follower, so that when two or more  
 “ chains or ropes are fixed and the middle shaft is turned  
 “ round it draws the follower with the cotton or other light  
 “ material close up to the end of the truck. Similar appa-  
 “ ratus is applied to each of the end frames of the truck or  
 “ wagon. The shafts may, if desired, be fixed on the ends  
 “ of the trucks without employing the intermediate frames.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, May 5.—No. 1289.

STATHAM, HARRY, and COLLINS, BENONI.—(*Provisional protection only.*)—Springs. This invention “ consists in form-  
 “ ing and constructing buffer and like springs of hollow  
 “ forms of india-rubber, by preference hollow rings circular  
 “ in form and section the hollow cavity being filled or charged  
 “ with air; these hollow rings or other hollow forms of india-  
 “ rubber or its compounds or other elastic material are  
 “ arranged upon a rod or rods against each other, or between  
 “ discs or plates of metal, or they are combined with solid  
 “ rings or other forms of india-rubber and inclosed in a case,  
 “ or with hoops, as hitherto. By making the rings or other  
 “ forms of india-rubber hollow and enclosing air therein more  
 “ elasticity is obtained with less weight of material and  
 “ greater resisting power and durability.”

Another part of the invention “ consists in making the  
 “ rings or other hollow forms of india-rubber or its compounds  
 “ with a small hole or holes through which the air can pass

“ to and from the hollow cavity; and such hollow rings  
“ will be found useful, more particularly for buffers, where  
“ it is desirable to check the reaction after compression and  
“ render it less sudden.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, May 10.—No. 1345.

BOTWOOD, WILLIAM.—Improvements in vehicles running on two wheels. The improvements relate to the mode of attachment of the shafts. The shafts are arranged “ to pass  
“ along each side of the body of the vehicle and to enter  
“ sockets at the back thereof; the fore parts of the body on  
“ each side are also connected with the shafts so that the  
“ shafts are able to pivot on the points of attachment. The  
“ shafts are made of elastic wood, such as lancewood, and at  
“ each step of the horse they are free to bend from end to  
“ end over the fulcrums or pivots which connect the fore part  
“ of the body to them. In consequence of the spring of this  
“ long length, but little horse motion is communicated to  
“ the body of the carriage. The bending of the shafts in  
“ this manner could not take place freely were they rigidly  
“ connected to the body at their hinder ends, but the slight  
“ to and fro movement which the sockets admit enables the  
“ portions of the shafts behind the pivots or fulcrums to bend  
“ as described. The sockets are lined with leather to prevent  
“ noise, and the shafts are tipped with brass at their rear  
“ ends to cause them to slide more freely in the sockets.  
“ The pivots or fulcrums are pins projecting from the body  
“ on each side and passing through loops fixed on the  
“ shafts.”

“ For the purpose of adjusting the length of the shafts to  
“ correspond with the length of the horse the loops on the  
“ shafts are made of considerable length so as to allow the  
“ shafts to move a distance lengthways on their pivots or  
“ fulcrums, and there are locking levers jointed to the shafts  
“ to hold the pivots or fulcrums at either end of the loops,  
“ or it may be in a position intermediate of the length there-  
“ of; springs keep these locking levers down except when  
“ they are purposely raised to shift the shafts in or out. To  
“ give the adjustment required for the height of the horse

“ the sockets at the hinder end of the body are arranged so  
 “ that they can be raised or lowered by means of screws.”

[*Printed, 10d. Drawing.*]

A.D. 1866, May 16.—No. 1392.

ELLIOTT, GEORGE AUGUSTUS.—(*Provisional protection only.*)—  
 Opening and closing carriage windows. The inventor says,  
 “ I connect a cranked handle to a pinion in gear with another  
 “ pinion on a vertical rod with a quick thread cut thereon.  
 “ To the lower part of the window I fix a bracket or matrix,  
 “ formed with an aperture to fit over the threaded rod; the  
 “ side of the aperture carries one or more projections which  
 “ take into the thread of the rod. By turning the handle the  
 “ pinions and vertical rod are caused to revolve, and the  
 “ bracket or matrix and consequently the window is raised  
 “ or lowered as the case may be. Instead of the second  
 “ pinion and vertical rod I sometimes make the first pinion  
 “ gear into a vertical rack on the window sash, so that when  
 “ the handle is turned the rack and therefore the window  
 “ receives a vertical motion.

“ Another mode of raising and lowering windows consists  
 “ in fitting a cranked handle to the axis of a roller or wheel,  
 “ the periphery of which is formed with cogs or projections  
 “ to take hold of the links of a chain which passes over this  
 “ roller and over a similar roller fitted to the lower part of  
 “ the carriage door or other fixed part. The chain is fixed  
 “ to any convenient part of the window sash, and as the  
 “ handle is turned the rollers revolve and act upon the chain  
 “ to raise or lower the sash. Sometimes I apply handles to  
 “ the outside of the carriages to act upon the rollers or upon  
 “ the vertical threaded rod to enable the windows to be closed  
 “ or opened from the outside.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, May 18.—No. 1413.

DEVILLIARD, PHILIPPE, and POSTWEILER, ACHILLE.—  
 Doors for landaus, &c. “ The great objection to the present  
 “ mode of manufacturing the doors of landaus and other  
 “ similar carriages is that they cannot be opened without  
 “ first lowering the glass, otherwise it would be broken. In  
 “ order to overcome this drawback,” the patentee makes



“ the door in appearance similar to an ordinary carriage  
“ door, having the framework complete and independent of  
“ that connected to the hood of the carriage, such part being  
“ so arranged simply to admit of the door opening and shut-  
“ ting freely. These two parts, that is to say, that fixed to  
“ the hood of the carriage and that forming the frame of  
“ the door, are so connected by hinges as to allow of all the  
“ parts moving and folding together when the hood is thrown  
“ back, and this without in any way interfering with the  
“ form of the carriage. When the hood is closed and the  
“ door in situ that part of the framework connected to the  
“ hood at the upper part of the carriage is secured by a tenon,  
“ and that of the door by means of screws, bolts, catches, and  
“ other suitable fastenings. The opening and shutting of  
“ the hood is precisely the same as usual ” the “ improve-  
“ ments consisting in the adaptation of a jointed framework  
“ to the door, so as to make it entire and capable of being  
“ readily folded together with the parts connected with the  
“ hood, in opening the carriage.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, May 31.—No. 1513.

CLARK, WILLIAM.—(*A communication from Leocadio Ramon-  
-y-Garcia.*)—Time and distance indicator. The chief feature in  
this invention consists in the “ employment of a sand or fluid  
“ reservoir discharging its contents into a suitable receptacle  
“ at each time the vehicle is occupied afresh. The number  
“ of chambers containing sand indicates at the close of the  
“ day the number of journeys made by the driver, and the  
“ quantity of sand in each indicates the length of each  
“ journey. This registering apparatus may be made to  
“ indicate both the time occupied and the distance travelled,  
“ it being for this purpose provided with two sand reservoirs,  
“ one of which discharges its contents into a special recep-  
“ tacle, being provided with a sluice having an intermittent  
“ motion imparted to it by one of the wheels at each revolu-  
“ tion. A comparison of the quantity of sand in this recep-  
“ tacle with the number of revolutions of the wheel will give  
“ the number of miles travelled.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, June 1.—No. 1529.

**BRÄUTIGAM, CHARLES.**—Locking or fore carriage. These improvements “relate to the connection of the bodies of  
“ common road carriages with the axles carrying the fore  
“ wheels, and consist in dispensing with the perch bolt and  
“ wheel plate, upon which in carriages of the ordinary construction the under carriage turns, and in substituting  
“ therefor two horizontal locking wheels or rings fitted one  
“ within the other. The inner ring is affixed to the body of  
“ the carriage, and the outer ring is affixed to the under  
“ carriage and turns upon the inner ring, which has upon its  
“ periphery annular projections, which engage with corresponding depressions formed in the inner side of the said  
“ outer ring, and thereby prevent the separation of the two  
“ rings. The outer ring is made in two or more segments,  
“ which are connected by screw bolts passing through lugs  
“ formed on the said segments, washers being interposed  
“ between the said lugs. This arrangement admits of the  
“ outer ring being fitted upon the inner ring, and screwed up  
“ from time to time to compensate for wear, the washers  
“ above referred to being in that case removed and replaced  
“ by thinner ones. A hole is formed in the outer ring  
“ through which oil may be introduced between the two rings  
“ for the purpose of lubrication.”

[*Printed, 8d. Drawing.*]

A.D. 1866, June 1.—No. 1534.

**BURROWS, WILLIAM, and BURROWS, JOSHUA.**—(*Provisional protection only.*)—Engines for common roads. The inventors describe this engine in the following terms:—“We arrange  
“ a vertical boiler in combination with a horizontal engine  
“ fixed thereto and geared with spur gear to the shaft of the  
“ fly wheel, the fly wheel acting as a break wheel. The  
“ starting and stopping motion is so arranged as to be at the  
“ hand of the driver and also the steering motion. This  
“ motion is so constructed that we can arrange it to be steered  
“ from any part of the carriage by means of a chain wheel  
“ fixed on the steering axle, and another wheel fixed at the  
“ place desired and most convenient, the two wheels to be  
“ connected by an endless chain which is under the body of

“ the carriage and transmits the power. The one chain wheel has a spindle which is carried sufficiently high for the driver to steer with; on the top a worm wheel is placed, gearing with an endless screw fixed on the hand steering wheel which is thereby easily turned. The starting and stopping action is transmitted immediately from (and the apparatus is convenient to) the driver’s hand by means of a rod or axis and hand wheel. The body of the carriage is made of wood or iron, in which there are two seats for passengers, these are fixed on a false bottom and rest on spiral steel springs, the resiliency of which renders it easy and comfortable to sit on. Under one of the seats is a water tank, into which the exhaust steam is admitted, and under the other seat is a box for fuel. The wheels are made of rolled T-iron with bar-iron spokes and cast-iron naves. The boiler is constructed with a conical fire-box and intersected by tubes, and they are so arranged as to produce a spiral draught, which causes the smoke to be consumed before any of the gases are allowed to pass out at the chimney, which, moreover, gives great additional heating surface to the boiler, and which constitutes a chief feature of our improvements. The steam is not allowed to pass through the chimney, but is condensed in the water tank under the seat by being blown through wire gauze on to the surface of the water.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, June 13.—No. 1604.

CAMBRIDGE, FREDERICK. — (*Provisional protection only.*)—Elevator for carts, &c. “ The object of the improvements is to facilitate the raising of hay or other agricultural produce for the purpose of more readily stacking it from loaded waggons or carts.” For this purpose the body of the waggon or cart is formed so that such body part may with its contents be raised from the carriage to different elevations. “ Cords, bands, or chains applied at or near the corners of this moveable body, pass upwards over pullies applied at the upper parts of uprights supported from the carriage or lower part of the vehicle, and are thence connected to a shaft or roller capable of revolving on axes or pivots, so that by causing the rotation of this shaft or roller

“ the moveable body of the vehicle may be raised or lowered  
 “ as desired; guide pulleys are applied as required. The  
 “ rotation of the shaft or roller may be effected by bars or  
 “ lever arms applied through holes formed in it, or by the  
 “ application thereto of a lever arm or handle; pawls and  
 “ ratchet or such like teeth prevent the return of the roller.  
 “ In place of cords as the lifting means, screws or racks and  
 “ pinions may be employed. Uprights are applied at the  
 “ corners of the movable part to retain the hay or other  
 “ agricultural produce from unduly pressing on the uprights  
 “ from the carriage or supporting part of the vehicle.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, June 22.—No. 1670.

WHITBY, TIMOTHY.—“ Improvements in springs for railway  
 “ and other carriages.”

According to this invention “ corrugated metal is used,  
 “ generally steel, and in constructing a spring for a railway  
 “ or other carriage to be used between the frame and body of  
 “ the carriage two corrugated plates are used, which are re-  
 “ spectively fixed to the frame and to the body of the carriage,  
 “ the fixing being ordinarily so that the ends of the plates are  
 “ free to slide to and fro, so that when the convex parts of one  
 “ plate are pressed more and more into the concave parts of  
 “ the other plate they tend to flatten the corrugations and  
 “ extend the length of the springs, whilst the reaction of the  
 “ springs causes the corrugation of the plates to assume their  
 “ normal form, and force the convex corrugations of one  
 “ plate out of the concave corrugations of the other plate.  
 “ More than two corrugated plates may be thus employed  
 “ between the body and frame of a railway or other carriage.”  
 and in some cases “ the plates of the springs may be fixed at  
 “ or near their ends.”

The patentee mentions that in forming buffer springs “ each  
 “ carriage may have only one corrugated plate affixed thereto,”  
 in which case he usually affixes the ends of the plates to the  
 frames of the carriages, the requisite play and elasticity being  
 obtained “ between the two points of fixture of each plate; or  
 “ more than one such plate to each carriage may be thus used  
 “ in constructing buffers between the two carriages; and in  
 “ some cases in constructing buffer springs between the ends

“ of carriages the fixing of the corrugated plates may, as before stated, be at a point or points intermediate of their length,” guards or checks being applied when requisite “ to prevent the corrugated plates ” separating “ laterally.”

A light carriage spring is described as being composed of two corrugated plates of steel, with a strip of leather between them, other modifications of the invention being also described.

[*Printed, 10d. Drawing.*]

A.D. 1866, June 26.—No. 1699.

HOLLISS, CHARLES PEACHEY.—Preventing vibration. This invention consists of “ improved modes of applying packing “ or elastic, flexible, and non-conducting materials, so as to “ completely surround the parts treated at all points of contact “ or connection ” thereby isolating them, preventing the transmission of sound, and counteracting the disagreeable results of vibration.

The invention is mentioned as being especially applicable to the axletrees, springs, and bearings of carriages and vehicles, to the rails, chairs, and sleepers of permanent ways, and to frames of machines. The packing employed is composed of india-rubber vulcanized or unprepared, cork, felt, leather, or cloth, separately or combined, but other materials may be used.

The patentee describes in the first place a “ novel clip ” which he designates an “ union clip.” “ This clip for the “ axletree and springs may be welded or made in one piece, “ with the surface which rests on the axletree extended “ outwards, so as nearly to abut against the flange of the “ axletree, and inwards several inches along the axletree, “ thereby giving a greater bearing surface to receive the “ packing, and the surface on which the springs rest is to be “ extended about six inches, with the ends turned down at “ right angles for the same purpose.” The springs have a corresponding plate rivetted to them, “ with the ends turned “ down at right angles over the end of the clip plate,” to prevent the springs from shifting from position, room being allowed for the packing. This clip “ entirely obviates the “ necessity of screwing up so tightly as at present practised

“ in the ordinary mode of fixing,” a certain top plate being “ screwed on to prevent recoil,” this being all that is necessary to retain the clip and springs in position, “ while the packing “ has full scope to exert its elastic force.” The axletree and springs are then, at the points of contact, surrounded with the non-conducting material, and so as completely to isolate one from the other, the union clip and top plates being then screwed up so as to fix up the springs in such a manner that the latter “ cannot possibly shift from their position and no “ sound can be transmitted to or through them.” The heads of bolts, and the different parts of other machines, may be packed in the same manner.

The patentee mentions that in applying his invention to railway carriages, omnibuses, and similar vehicles, he prefers to “ attach the under carriage and springs to a frame of iron, “ or wood, or both combined,” the body being then embedded in the frame, and the packing applied as desirable, such packing, if necessary, being inserted between the rims and the tyres of carriage wheels.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, June 27.—No. 1716.

HART, HERBERT WILLIAM. — (*Provisional protection only.*)—Brush or scraper for carriage wheels. The inventor says, “ I “ form the brush or scraper of a U shape so that it shall “ enclose the tyre and felloe on three sides, and thus effectually “ prevent the mud or dirt from accumulating thereon. This “ brush or scraper is placed at the end of a lever or arm, “ which is adapted to or secured on to the axletree or other “ convenient part of the carriage. It will be advantageous “ to construct this arm of a flat steel bar, so that it will be “ capable of yielding slightly when required, and yet will “ keep the brush or scraper against the wheel without any “ undue pressure, which would create too much friction.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, June 28.—No. 1728.

CLARK, DANIEL KINNEAR. — Traction engines. “ In con- “ structing a locomotive traction engine the principal framing “ is composed of two parallel longitudinal frame plates of

“ iron or steel. At the front end these frame plates are  
“ connected by transverse plates with which is combined an  
“ upright frame, or it may be a hollow shaft, constructed of  
“ angle iron, or of angle iron and plates, wherein is arranged  
“ the steering apparatus and gear for steering the carriage  
“ by a vertical shaft or spindle. The hinder part of the main  
“ frame is constructed of transverse frame plates with angle  
“ iron and a foot plate which connect the two longitudinal  
“ frame plates together. The boiler, which is fixed to and  
“ carried by the main framing, is similar to an ordinary  
“ tubular locomotive boiler. The axle or shaft of the driving  
“ wheels is situated forward of the fire-box of the boiler and  
“ so as to throw as much weight as is required on such axle  
“ or shaft. The fore part of the carriage is supported by a  
“ pair of wheels which are on a shaft or axle which is con-  
“ nected to the lower end of a vertical shaft or spindle, and  
“ the fore wheels are arranged to have a locking motion in  
“ order to steer or guide the carriage. The framing, steam  
“ boiler, steam cylinders, water tanks, and other parts con-  
“ nected therewith are for the most part carried by the main  
“ driving wheels by the aid of springs which are applied in  
“ the ordinary manner, but the vertical play of the axle boxes  
“ or bearings of the driving wheels is controlled by blocks of  
“ vulcanized india-rubber at top and bottom. The two steam  
“ cylinders are fixed in an inclined position to the main  
“ framing, one on each side and near the fore end thereof.  
“ The piston rods of the two steam cylinders give motion to  
“ a shaft below the boiler, from which shaft motion is com-  
“ municated to the second shaft by means of two pairs of  
“ toothed wheels so as to give two speeds. The second shaft  
“ carries differential gearing, and is on the same horizontal  
“ line with the shaft or axle of the driving wheels. The two  
“ toothed wheels of the driving gear on the second shaft or  
“ axis which give motion to the driving wheels by means of  
“ pinions on the second shaft, which take into wheels thereon,  
“ are combined together by a framing or a hollow chamber  
“ in which is contained the differential gearing, and such  
“ framing or hollow chamber is situated on such second shaft  
“ intermediate of its two end bearings. Friction connections  
“ may be applied to the differential gear to act as a break to  
“ its motions. In some cases ” the patentee applies “ friction

“ driving wheels or rollers over and bearing on the driving wheels or on rollers attached to them. The engines may be arranged to drive the two driving wheels separately, or the combined power of the two steam engines may be applied to drive the two driving wheels. Friction couplings may be applied to the second shaft to admit of the yielding of the driving wheels or gearing when over strained. The vertical shaft or spindle may be actuated by any suitable gearing to steer the carriage.” The patentee uses “two screw shafts with screw nuts and links for this purpose. When a worm wheel is employed in steering apparatus the wheel is made of two similar parts or halves in order that when the teeth become worn the wear is compensated by setting up the parts slightly, so that the parts of the teeth of one part will come slightly in advance of their corresponding parts of the other part, and the driving screws are also formed in two parts to obtain a like result.”

In some cases sand boxes are used.

[*Printed, 10d. Drawing.*]

A.D. 1866, June 29.—No. 1735.

IMRAY, JOHN, and ELLIS, JOSEPH. — “Improvements in carriage windows and other sliding frames.”

The object of the invention is to provide a means of holding the window in position. “To effect this,” say the patentees, “we form inclined recesses in those parts of the frame which slide in the grooves, and fit them with wedges, which have their thick ends downwards, and which are pressed upwards by springs. On the sliding frame we mount levers, which bear on the small ends of the wedges, and which have suitable knobs or latches that can be depressed by hand. One side of each wedge bears against the groove, and the other against the inclined face of the recess, to which it is fitted; and to facilitate the upward and downward movements of the wedge small rollers may be interposed between the inclined faces. When the window is drawn up the rubbing of the wedges on the grooves bears them downwards, and thus eases the friction; but when the window is left to sink by its own weight the springs force the wedges upwards, and so tighten the window in the grooves. On



“ depressing the knobs or latches by hand the levers push  
“ down the wedges, and slack them so that the window is  
“ free to move. Instead of wedges sliding rectilinearly, we  
“ sometimes make them of volute cam or eccentric form,  
“ turning on axes, and acted on by springs for tightening,  
“ and hand levers for slacking their friction.”

[*Printed, 8d. Drawing.*]

A.D. 1866, July 2.—No. 1757.

APPLEBY, CHARLES JAMES.—(*Provisional protection only.*)—  
Traction engines. “ These improvements consist, firstly, in  
“ using the grooved wheel frictional gearing in place of spur  
“ gear for transmitting motion to the driving wheels.”

“ Secondly, a second pair of friction wheels may be fixed  
“ upon the same shaft as the slow motion wheels and pinions,  
“ and when the load is started the higher speed wheel is  
“ thrown into gear and the lower speed wheel out of gear  
“ without stopping or arresting the motion of the train of  
“ trucks.”

“ Thirdly, the bearings of the driving wheels are arranged  
“ so that whatever may be the play upon the springs the  
“ centres of the gearing wheels and pinions always remain  
“ equidistant, and this arrangement is applicable to either  
“ frictional or spur gear. This is effected in two different  
“ ways, either of which is adopted as circumstances require.  
“ In some cases the bearings are carried by two links coupled  
“ to the supporting springs and pendent therefrom; these  
“ springs will be free to act without imparting any motion  
“ to the gearing wheels and pinion relatively to each other.  
“ In other cases the same result is obtained by allowing the  
“ bearings of the driving axle to slide in a quadrant-shaped  
“ horn plate, the curve being struck from the centre of the  
“ crank shaft.

“ Fourthly, as great lightness is desirable in many cases  
“ where the ‘metals’ are light, or the road of a temporary  
“ character, especially when a high speed is used” it is  
proposed to “ make the engine frame of sufficient length to  
“ take a truck, body, or other receptacle for useful weight,  
“ so that this weight might be used when required to increase  
“ the tractive power and dispensed with when it was not

“ required, as, for instance, when the train of trucks was  
“ running empty.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, July 18.—No. 1873.

GEDGE, WILLIAM EDWARD. — (*A communication from Elie Larivière.*)—(*Provisional protection only.*)—Releasing horses.

“ The mechanism consists of an iron trace bar furnished at  
“ each end with a hook for attaching the trace; this trace  
“ bar is moveable, that is to say, it turns in a bearing fixed  
“ on the draw bar of the carriage. In the middle of the  
“ length and perpendicularly to the trace bar is fixed a  
“ hinged rod in three pieces lengthwise, so as to act as a  
“ lever on the trace bar, in order to give it a rotary move-  
“ ment on itself, which uplifts the hooks inwards for the  
“ withdrawal of the traces, which is the normal position  
“ attained by bringing the said rod beneath the carriage  
“ framing, where it is held by a vertical shaft turning in the  
“ pole pin, hollowed for this purpose, or in two wheeled vehicles  
“ in an analogous piece. At the end of this rod is a plate  
“ pierced with an opening through which passes a hook fixed  
“ at the bottom of the revolving shaft. It is only necessary  
“ to cause this shaft to turn to make the hook slide under the  
“ solid part of the plate and hold it until the coachman gives  
“ another rotary motion so as to bring the hook into the  
“ opening in the plate, which then escaping from the shaft,  
“ being drawn away by the tension of the draw bar is pushed  
“ back by a spiral spring, which the plate closes in attaching  
“ itself to the shaft. In order to facilitate the fall of the  
“ traces they are furnished at their ends with a small friction  
“ roller, to which they are attached by a buckle or otherwise,  
“ and it is this roller which hooks on to the trace bar. The  
“ backing apparatus is fixed to a moveable catch which  
“ places itself in an ordinary manner against the shaft or  
“ the pole, according to whether it is a two or a four-wheeled  
“ carriage, on a fixed plate, against which it is held by a  
“ spring sufficient to hold of itself, but which comes off  
“ easily directly the horse leaves the shafts. A small strap  
“ attached to the driver's box facilitates this movement by  
“ causing this spring catch to come off. The releasing

“ handle is placed indifferently in any part of the carriage,  
“ either within reach of the coachman or of the persons inside  
“ the coach, and the cord may be hidden in the casing.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, July 28.—No. 1957.

PHILLIPS-SMITH, JOHN.—Traction engines. The first part of this invention relates to the use of ratchets and pawls for the purpose of preventing the running down hill of traction engines and vehicles in case the propelling power should become deficient. “The second part,” says the patentee, “consists of a peculiar arrangement of the engine itself, “whereby no part of the engine is placed on the top of the “boiler as hitherto practised. I place the two cylinders inside the main framing and below the boiler, and bolt them “strongly to a transverse frame, the centre lines of the said “cylinders being parallel to the longitudinal centre line of “main frame; the crank shaft is also placed below the boilers “being parallel to the axle of the travelling wheels, which it “actuates by means of a spur pinion and spur wheel, or an “endless chain and stud wheels. The whole of the working “parts of the engine being thus placed below the boiler, and “fastened to the main frame, the necessity for bolting or “rivetting brackets or other fixtures to the boiler, which is a “certain cause of leakage, is thereby dispensed with, besides “which the engine and gearing work much more steadily, “and I am enabled to place a steam dome of large size on the “top of the boiler, and thereby ensure a good supply of dry “steam and prevent priming.”

[*Printed, 1s. Drawings.*]

A.D. 1866, August 1.—No. 1981.

GILMAN, EDWARD.—(*Provisional protection only.*)—Velocipede. The following description is given by the inventor:—“My “velocipede consists primarily of a perch carried by three “wheels (namely, two leading wheels and one driving wheel), “the latter being actuated by means of treadles and cranks. “The rearward portion of the perch is divided or forked, and “the driving wheel is mounted within the forked part by “means of an axle or shaft, which is carried in suitable bear-

“ ings attached to the perch, and is provided with a crank at  
 “ each end outside the bearing, the cranks being so arranged  
 “ as to alternate in motion with each other. Each of these  
 “ cranks is connected by a link or connecting rod to the rear  
 “ end of a treadle, the forward end of which is hinged or  
 “ jointed to the forward end of the perch, which is made to  
 “ curve downwards for the purpose; the forward end of the  
 “ perch is supported by an axle having two leading wheels  
 “ (one at each end thereof); this axle is so mounted as to be  
 “ capable of swivelling on a vertical pin by means of a cross  
 “ handle or lever in front of the operator, who can thus guide  
 “ or direct the velocipede as occasion may require. The  
 “ treadles (which pass between the two leading wheels and  
 “ outside the driving wheel) are to be worked by the alternate  
 “ motion of the feet of the operator either in a standing or  
 “ sitting posture astride of the perch as near to or over the  
 “ axis of the driving wheel as convenient; a saddle or seat  
 “ may be attached to the perch for that purpose, such seat  
 “ being capable of being raised or depressed at pleasure to  
 “ suit the stature of the different persons using the veloci-  
 “ pede. The alternate motion of the treadles communicates  
 “ a continuous circular motion to the driving wheel by means  
 “ of the two links or connecting rods, and the cranks on the  
 “ ends of the driving axle.”

[Printed, 4d. No Drawings.]

A.D. 1866, August 27.—No. 2203.

**BROOMAN, CLINTON EDGUMBE.**—(*A communication from Jean Pierre Hafner and Louis Désiré Guillet.*)—(*Provisional protection only.*)—Brake. This brake is described in this provisional specification, but a sufficient idea of its operation may be gathered from the following extract. It operates only upon the hind wheels and is fitted with an apparatus by which its action may be suspended if desired.

“ The action is as follows:—The carriage when it is being  
 “ stopped possesses a movement of inertia, which is greater  
 “ or less according to the speed at which the carriage has  
 “ just been moving. It is this power of inertia which effects  
 “ the automatic application of the breaks. The reason is  
 “ simple; the horses being stopped suddenly, keep the whole

“ of the front under frame of the carriage for the moment in  
“ an invariable position, because they are yoked thereto. The  
“ result is that the horses and front under frame, by remain-  
“ ing stationary or having at least a slower speed than just  
“ before, allow the carriage body and the parts fixed thereto  
“ to advance a little by sliding one upon another of the upper  
“ locking plate or disc and its supporting plate. This effect  
“ it will be understood is only due to the force of inertia of  
“ the whole back under carriage frame after the sudden  
“ stoppage of the horses or the slackening of their speed.  
“ This displacement of the carriage body upon the front  
“ under frame produces the oscillation of the small lever  
“ and a tractive power upon the two rods before mentioned,  
“ which thereby apply the breaks blocks against the hind  
“ wheels.”

*[Printed, 4d. No Drawings.]*

A.D. 1866, August 29.—No. 2226.

RICHARDS, JOSEPH, and GRINDLE, ROBERT.—Axle. The  
“ improvements,” say the patentees in their description,  
“ consist in so forming axles that greater strength with  
“ increased bearing surface may be afforded at the neck or  
“ part in contact or that works close to or in connection with  
“ the collar or inner end of the axle and axle box or bush,  
“ and this we effect by forming a conical incline rising from  
“ the parallel of the axle towards the neck or collar, which  
“ not only prevents the wheel or box wearing away the  
“ leather washer commonly used for holding and retaining  
“ the oil by which the same is lubricated, but affords much  
“ additional strength at this important part, as well as  
“ preventing the dirt or grit from use working into the  
“ wearing surfaces of the axle and axle box or bush. We  
“ also form a corresponding conical or angular bearing in  
“ the axle box to the conical bearing before referred to, from  
“ which it will be seen that when the axle box (which forms  
“ the concentric centre bearing of the wheel) is placed fully  
“ on the axle the two inclined surfaces will incline towards  
“ the central parallel portion of the axle, and be brought in  
“ complete contact by a corresponding portable annular  
“ conical bearing placed on the outer end of the axle coming  
“ in contact with a corresponding incline formed in the

“ interior of the outer end of the axle box or bush, and held  
 “ in position by the usual screw, set screw, and pin. As a  
 “ further security for preventing the dirt or grit working  
 “ into the joint before referred to, we form a flange around  
 “ the neck of the axle overlapping the inner end of the axle  
 “ box or bush.”

[*Printed, 10d. Drawing.*]

A.D. 1866, August 30.—No. 2235.

CLAIRMONTÉ, ADOLPHUS JULIAN.—(*Provisional protection not allowed.*)—“ The elastic tubular india-rubber air-chambered  
 “ pannels.”

“ These pannels are formed by a congeries of india-rubber  
 “ tubes with one or more air chambers running through  
 “ them, and which may be covered either separately or wholly  
 “ with leather or woollen or cotton cloth, as may be required.  
 “ These pannels are to be applied . . . to the cushions of  
 “ and seats to railway and other carriages.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, September 12.—No. 2342.

WILLIAMS, JOHN.—Seats for two-wheeled carriages. The  
 invention consists “ in arranging and constructing the seats of  
 “ two-wheeled carriages adapted to carry four persons. In-  
 “ stead of dividing the seats of the said carriages in the ordi-  
 “ nary way, that is, transversely,” the patentee says, “ I  
 “ divide the seats longitudinally; by this division the front  
 “ and back seats on one side of the carriage are separated from  
 “ the front and back seats on the other side of the carriage,  
 “ and each pair of seats can be moved forwards or backwards  
 “ independently of the other pair. In order to provide for the  
 “ motion of the seats, I fix a bar across the upper part of the  
 “ carriage above and parallel to the axle. Upon this bar, and  
 “ at right angles thereto, a strip of wood is fixed horizontally,  
 “ the said strip passing along the middle of the top of the  
 “ carriage. This strip of wood has grooves in either edge,  
 “ and similar and parallel grooves are made in the inner  
 “ sides of the carriages opposite to the grooves in the edges of  
 “ the strip. There is thus formed two pairs of grooves in  
 “ which the seats of the carriage are respectively fitted, and

“ in which they slide, the said seats being provided with ribs  
“ or projections on their edges, which ribs or projections take  
“ into the said grooves, or the seats may slide on bars of angle  
“ iron. By this arrangement the seats on either side of the  
“ carriage can be moved forwards or backwards without inter-  
“ fering with those on the other side. A thumb screw or  
“ spring catch or other fastening may be employed to fix the  
“ seats in any required position. I construct the seats of the  
“ carriage in the following manner:—Instead of rigidly fixing  
“ the backs to the seats, I connect them therewith by means  
“ of stop hinges, which allow the said backs to be inclined  
“ either backwards or forwards at an angle of eighty degrees  
“ or at any other required angle. I provide the moveable  
“ backs with bolts, by which they may be fixed in a vertical  
“ plane when required. When preferred, fixed backs of the  
“ ordinary construction may be used in conjunction with the  
“ sliding seats herein described.”

[*Printed, 8d. Drawing.*]

A.D. 1866, September 20.—No. 2414.

WALKER, GEORGE JAMES.—(*Provisional protection only.*)—  
Brake. This invention “ consists in employing in combination  
“ with the metal hoop or stock of the wheel projections or in-  
“ dentations in the form of teeth or otherwise, into which  
“ clutch links (supported from fixed bearings secured to the  
“ axle through the medium of a crank arm and clip) are  
“ caused to take when required for the purpose of stopping  
“ the revolutions of the wheel upon the road, the said clutch  
“ link being actuated by a system of intermediate scroll levers  
“ and coupling chains connected with cords, tassels, or other-  
“ wise attached to the carriage in any convenient manner, by  
“ which means the break is put in action by throwing the  
“ said clutch in or out of gear with the projecting teeth or  
“ indentations aforesaid, whereby the said break power may  
“ be readily applied or withdrawn without necessitating any  
“ other movement than that of simply pulling the cords while  
“ seated on the box, or otherwise, the above principle admit-  
“ ting of the same being applied to one or more of the wheels  
“ either simultaneously or otherwise.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, September 22.—No. 2435.

**FREEMAN, SAMUEL RICHARDS, and GRUNDY, ABRAHAM.**—(*Provisional protection only.*)—Brake. This invention consists essentially in the employment of brake wheels, which are mounted upon the axles or connected with the wheels of railway and other vehicles, and each having passed around it a metallic band or jointed arm carrying brake blocks, each brake wheel having an angular groove in its periphery, and the brake blocks being of corresponding figure, so that when the metallic band or jointed arm is tightened around the brake wheel the blocks are forced into the annular groove. One end of each band or arm is connected with the framing of the vehicle, and the other with a quick-threaded screw mounted in suitable bearings, to which a longitudinal motion may be given either by having it passed through a stationary nut, in which case the screw revolves, or a revolving nut may move the screw. Or in the case of vehicles for common roads, one end of the band or jointed arm may be connected with a lever so placed as to be at the command of the driver, and by employing a metallic band composed of spring steel, the blocks will be released from the wheels when the pressure is removed from the lever.

The invention is applicable “to all machines which require  
“to be governed by break power.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, October 9.—No. 2597.

**MONNIN, JEAN, BOSC, CHARLES, and BOISSENOT, CLAUDE ANTOINE.**—Time and distance indicator. The “improvements  
“consist in fitting and applying to the interior of a carriage  
“and behind the seat thereof, a large back occupying the  
“whole breadth of the carriage, stuffed or padded on one side,  
“the opposite side of which is provided with prongs or other  
“appliances, so that the seat cannot be occupied unless in its  
“proper position without injury to the occupier. The position of this seat when the vehicle is occupied is that of an  
“ordinary easy chair, that is, vertical; and when the carriage  
“is not occupied the back is reversed, that is, the top will be  
“inclined forwards in such a position that the prongs will  
“project upwards, and it will be found impossible to enter the  
“carriage. By inclining the back forwards, the words, for



“ example, ‘empty carriage,’ are exposed to view, and as soon as a person wishes to use the carriage, the driver places the back in position by means of his hand, or by a lever or cord without leaving his seat; this action hides the words ‘empty carriage,’ and at the same time sets the indicator into action, so that it may show the moment and the time the vehicle is occupied.” The patentees “employ an indicator having one or several dials visible, the mechanism of which is enclosed in a box completely shut up. On one of the dials the time is shown inside the carriage.” They “consider as a good arrangement that a needle shall return to zero each time that the passenger or occupier of the carriage changes, without stopping the indicator inside the closed box which registers the day’s work. The time when the carriage has been engaged and when it has not been engaged is shown by particular marks on one or other of the dials, or on one of the several strips of paper; these different marks are regulated by the articulation of the back. The means provided for transmitting motion from the driver to the back, and from the latter to the indicator, must be placed in strong frames, and the whole must work with great facility and in such manner that from the outside the parts may not be interfered with.”

[*Printed, 8d. Drawings.*]

A.D. 1866, October 13.—No. 2655.

COLLINS, SMITH.—Securing tires on wheels. This invention consists “in forming the inner surface of the tire concave, and the outer surface or periphery of the felly convex, corresponding to the concavity of the tire, so that the tire expanded by the heat in the usual manner and placed upon the wheel contracts firmly upon the wheel, and its concavity prevents its accidental removal from the wheel.”

[*Printed, 1s. Drawings.*]

A.D. 1866, October 16.—No. 2670.

GORE, WILLIAM HENRY POSLETHWAITE.—Hansom cabs and other carriages. “In the first place the floor and the roof of the cab are made of a semicircular form in front, and are furnished with curved grooves in which the doors slide at

“ top and bottom ; this semicircular portion is divided into  
“ three equal parts, the central part being fixed to the roof  
“ and floor at top and bottom, having its lower portion  
“ panelled and its upper half glazed ; the side portions are  
“ similarly panelled and glazed, but are moveable, sliding in  
“ the grooves above and below, and thus forming curved  
“ sliding doors. When either door is opened it slides behind  
“ the fixed central portion ; and the grooves are so arranged  
“ that the doors slide behind each other.

“ The following improvements are applicable to cabs made  
“ with the semicircular front, as above described, or to cabs  
“ made in the usual or other form, and to other wheeled car-  
“ riages :—The side windows are made of a circular form  
“ having a revolving glass shutter by which they may be  
“ wholly or partially closed when desired. On the roof of the  
“ cab are three small hinged signal arms which may be elevated  
“ or depressed from the inside by means of a small knob or  
“ handle, and are for the purpose of directing the driver to  
“ turn either to the right, or the left, or to stop. The roof  
“ of the cab when made of papier maché is to be covered with  
“ thin sheet copper or other metal to protect the same from  
“ injury and from the effects of wet weather, such metal to be  
“ rivetted to the angle iron frames, and painted or japanned  
“ in the ordinary manner. The doors are to be made of a  
“ grooved metal frame, somewhat similar to the frame of a  
“ school slate, and filled in with papier maché panels ; three  
“ sides of the frame to be made in one piece and the fourth  
“ moveable, so that the panel can be made to slide in and then  
“ be fixed by screwing or fixing on the fourth side of the  
“ frame. The breasts of the cab may also be made in the  
“ same manner. In cabs made with flexible windows to  
“ draw down in front or push up under the roof I make the  
“ bands or laths which are hinged together of iron or other  
“ metal in somewhat similar manner to that described for the  
“ doors and breasts of the cab, with spaces for the glass to be  
“ inserted, the said glass to be fixed in the metal frame with  
“ putty or other similar material, or the grooves to be lined  
“ with cloth or other soft substance to prevent the glass from  
“ rattling. The ends of the bands or laths run in iron or  
“ other metal grooves in the sides of the cab. Inside the

“ papier maché back of the cab or carriage, and between it  
“ and the lining or stuffing, I propose to place thin plates of  
“ perforated steel or other metal to prevent the poles of other  
“ carriages in crowded thoroughfares from penetrating  
“ through the back and injuring the occupants. Instead of  
“ making the square part of the axle with two of its sides  
“ vertical and two horizontal, as usual, I make it anglewise,  
“ or with all the sides diagonal to the ground, by which  
“ means, I get a wider bearing for the axle arms to which the  
“ springs are attached. I make the shafts of angle iron, filling  
“ in the angle underneath with wood, the rear ends of the  
“ said shafts being carried on and forming part of the frame  
“ of the bottom of the cab. The tire of the wheels I make of  
“ a trough-like section, so as to embrace the sides of the  
“ felloes, the object being to protect the sides of the felloes  
“ and prevent their being worn away by coming in contact  
“ with the curb or otherwise. I make the boxes of the wheels  
“ of iron with hollow iron sockets (which are slightly taper  
“ screwed therein, and the inner ends of the wooden spokes  
“ are driven tightly into these iron sockets. In some cases in  
“ circular fronted cabs I propose to make the doors open on  
“ hinges and to make the windows flexible, but to slide  
“ horizontally in grooves in the sides of the cab when open,  
“ and to slide in grooves in the top of the doors and meet in  
“ the centre when closed. In this case the fastening of the  
“ doors must be so arranged that they cannot possibly be  
“ opened when the windows are partially closed, that is  
“ when the window partly is in one groove and partly in the  
“ other.”

[*Printed, 8d. Drawing.*]

A.D. 1866, October 17.—No. 2678.

HARVEY, WILLIAM.—Omnibus. This omnibus is supported upon two wheels. The framing is of iron and the springs are of india-rubber in iron boxes. It may be drawn by one or two horses. The body is made in two floors. The lower floor is reached by a door from the rear and in the centre over the axle are steps or stairs by which ascent is made to the upper part. The seats below are arranged so that the passengers

look in the direction of the vehicle; above the seats are longitudinally placed and are back to back. The upper part is enclosed by curtains and a roof. The ends of the framing project downwards to serve as props in case of need.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, October 19.—No. 2701.

OCKERBY, FEATHERSTONE. — (*Provisional protection only.*)—Hansom cab. The inventor says, “1st, instead of making the  
“ body with a driver’s seat fixed on a footboard and boot,  
“ which footboard and boot is framed and bolted into the  
“ back of the body, I make a plain body without footboard  
“ or boot just as the hind part of an ordinary brougham is  
“ made; then I make two pump handles of iron well canted  
“ in with two lugs on each; I connect these pump handles by  
“ welding a cross stay to each of them. I fix these pump  
“ handles as in an ordinary brougham, and to the stay that  
“ connects them I fix my cross spring as in an ordinary  
“ Hansom safety cab; I then make my driver’s seat, and  
“ footboard and toeboard all plated and screwed together,  
“ making as it were a kind of rumble; this driver’s seat or  
“ rumble I fix upon the pump handles by means of two iron  
“ stays that are bolted on the bottom of each side of the  
“ footboards and the four legs or feet of which are then bolted  
“ to the lugs on the pump handles.

“2nd, instead of fixing the shafts to the footboard and  
“ bottom sides by means of iron plates and stayes I fix them  
“ to two elastic rails made of lancewood; round this rail on  
“ each side near the junction of the shafts I fix the swivel of  
“ a jack made of iron; near the other extremity of each of  
“ these elastic rails I fasten an iron hoop, and bore a hole  
“ through the side of the hoop and rail; then I fix to the  
“ bottom side rail on each side of the cab body beneath the  
“ footboard the shackles of a jack, and fasten it to the swivels  
“ on the elastic rails with a bolt on each side; this fastens or  
“ attaches the shafts and elastic rails to the front end of the  
“ cab; then I make two pendant scroll irons having two arms  
“ each; I attach with screws one of these arms to the seat  
“ rail on each side, and the other arm I attach to the pump  
“ handle and crop stay on each side with small clips; then

“ I connect the hind part of the cab by means of these pendant  
“ scroll irons to the holes in each side near the end of the  
“ elastic rails with four bolts and shackles, so that the elastic  
“ rails can work, and that fastens this improved body to this  
“ improved under carriage.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, October 22.—No. 2721.

DAY, JOHN.—Four wheeled carriage. This “invention is  
“ designed for the purpose of economising the space usually  
“ occupied by four-wheel vehicles, and also utilizing such  
“ space both for the comfort and easy conveyance of pas-  
“ sengers and also for their luggage, and the invention  
“ consists in constructing the hind part of the vehicle in the  
“ form of an improved ‘safety cab’ that is, a cab with a  
“ circular or angular front having the ‘boot’ behind; this  
“ portion of the vehicle is constructed so as to ride over the  
“ hind wheels, similar to the ordinary ‘safety,’ the door being  
“ formed behind for the entrance of the passengers; in front  
“ of this portion of the vehicle and immediately over the  
“ front wheels, in the space usually occupied by the seat of  
“ the driver in a four-wheeled coach, a platform is arranged  
“ upon which the passengers luggage or other articles or  
“ merchandize may be placed, or seats may be so arranged  
“ that in fine weather the passengers may ride upon such  
“ platform if desired. By this arrangement the distance  
“ between the axles of the front and back wheels is consider-  
“ ably reduced, and the passengers are enabled to have their  
“ luggage in view when travelling.” “The boot and driver’s  
“ seat is secured behind the body on one side, the entrance  
“ or door being arranged and formed at the opposite side.  
“ In order to equalize or adjust the pressure or rigidity of the  
“ front platform an adjustable link is provided, which connects  
“ the platform and front axle in such a manner that by  
“ turning a wheel they may be brought into close and firmer  
“ contact, thus effecting greater compactness and steadiness  
“ in the front part of the vehicle. Sliding doors may be  
“ employed in place of the ordinary hinged door if desirable.”

[*Printed, 6d. Drawing.*]

A.D. 1866, October 26.—No. 2775.

LATTER, LEONARD.—(*Provisional protection only.*)—Brakes. To the carriage are attached “two lever arms pivoted at their upper ends to a transverse rod fitted in bearings in the framework of the carriage. These lever arms are faced with wood, and are pendant immediately in front of the hinder wheels (of a four-wheeled carriage); their lower ends are connected by a second transverse rod or bar, the whole swinging freely backward and forward on the pivot above mentioned, and so disposed as to fall backwards a little from contact with the wheels. To the middle of the lower bar a chain is attached, which is conducted over a pulley fixed behind the axletree of the hind wheels, and thence between two upright guides fixed on the upper surface of the fore axle immediately under the locking plate pivot of the vehicle. From this point the connection is carried forward in the form of a rod disposed under the pole, and is attached to a lever pivoted near the point of the pole, to the upper end of which lever the pole chains are attached. By this arrangement the strain of the horses upon the pole chains in backing is transmitted through the rod of communication to the break chain before mentioned, causing the break surfaces to bear against the peripheries of the wheels and so stop the vehicle.”

“By another arrangement of the chain, instead of passing it over a single pulley and so to the lower transverse bar, it may be forked about midway between the locking pivot and the hinder axletree, each part being carried over a pulley approached towards either wheel, and thence conducted direct to the lower extremities of the break surface levers. If it is desired to back the carriage without operating the breaks a bolt or other suitable stop is dropped by the driver into a notch or hole in the connecting bar, which precludes its moving longitudinally.

“In applying this invention to two-wheeled vehicles, two levers similar to the lever at the point of the pole are placed one on each shaft, to the upper ends of which levers the breeching is attached, while from the lower ends chains or rods pass under the shafts, thence over the pulleys to the breaks, and operating them as before described.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, October 27.—No. 2782.

TIFFIN, CHARLES, junior.—Perambulators. This invention relates to perambulators and similar carriages constructed to fold up. The patentee thus describes his improvements:—

“ For the purpose of forming the frame of the carriage I  
“ construct each side portion thereof of two pieces suitably  
“ bent or shaped, and jointed or pivotted together at some  
“ convenient part or portion of the length of each respectively; these two sides pieces of the frame formed in this  
“ manner may be connected together by means of a stretcher  
“ rod or stay regulating their distance from each other at  
“ their points of junction or motion; the two side pieces  
“ which are connected with the fore axle, are placed or fitted  
“ inside of the two side pieces connected with the hind axle,  
“ and by means of the axle or axles, the hand rail or bar, and  
“ a footboard and stretcher (where necessary) the side frames  
“ are fixed and maintained at their proper distance from each  
“ other, according to the length or width of the seat, whether  
“ the carriage be intended to hold one or two children or  
“ persons. To the lower end of each of the two longer sides  
“ pieces a scroll or other suitably formed piece may be fitted  
“ for the purpose of receiving the axle of the fore wheel or  
“ wheels; whilst at the upper end a hand rail or stretcher  
“ piece is introduced for the purpose of propelling the carriage. Between the side pieces and at about the centre of  
“ their length the seat or body is fitted securely, and arm  
“ pieces are hinged at a convenient height above the seat;  
“ these arm pieces, stretcher bars, or extension pieces keep  
“ the jointed cross pieces forming the side frames properly  
“ expanded. A single or double hinged footboard is also  
“ mounted between the side frames in such a manner that it  
“ may be folded or closed for the purpose of further economizing space when the perambulator is folded. The upper end  
“ of each short cross piece forming part of the frame is received  
“ into the outer end of the arm piece or rest, so as to form a  
“ secure fixing, by which the jointed cross pieces or side  
“ frames are held asunder whilst the carriage is in use. At the  
“ lower end of the same piece a scroll or spring is secured, and  
“ by this means connection is effected with the axle of the hind  
“ wheels. Then it will be seen that each side frame is

“ formed of but two pieces irrespective of the arm piece or  
 “ rest which forms a stretcher, and that there is but one  
 “ pivot or joint instead of several. Instead of making the  
 “ side pieces or frame of wood they may be made of metal,  
 “ and the stretcher bars and other parts may also be made of  
 “ metal tubes or rods.”

[*Printed, 8d. Drawing.*]

A.D. 1866, November 6.—No. 2879.

CLAPP, WILLIAM HENRY.—(*Provisional protection only.*)—  
 Brake.—For this purpose the inventor employs a hollow disc  
 “ of metal with notches or cogs rising from its outer rim or  
 “ edge, and made to fit upon the inner stock of a wheel; the  
 “ cogs are reversed as required for acting either when going  
 “ up or down hill; the disc is fastened to the box of the  
 “ wheel, and strongly secured to prevent it turning by  
 “ means of caulking entering into the stock of the wheel.  
 “ Discs may be made with either one or more cogs, the  
 “ smaller number being suitable for small vehicles such as  
 “ perambulators. In conjunction with the disc there is  
 “ employed a rod or bar of metal, the one end thereof  
 “ having a hinge, and being fastened by bolts and clips, or  
 “ otherwise, to the axle or any part of the vehicle; the other  
 “ end of the said rod or bar is shaped so as to fit in between  
 “ the cogs on disc. If necessary the piece of metal at the  
 “ end of the rod or bar, and which fits the cogs, may have  
 “ leather or india-rubber attached to it so as to prevent the  
 “ scratching of any paint that may be placed upon the disc.  
 “ Also in conjunction with and attached to the rod or bar is  
 “ employed a metal spring, which when at liberty presses the  
 “ end of the rod or bar into the notches or cogs made for its  
 “ reception. When the weight of the metal end of the bar  
 “ entering the cogs is sufficient, and when its course is down-  
 “ wards the spring may be dispensed with. If required the  
 “ rod or bar with its end fitted to the cogs of the disc is  
 “ made to pass between, and to be guided by means of a  
 “ staple of metal fixed with bolts or clips upon a suitable part  
 “ of the axle or of the vehicles; this staple is made very strong,  
 “ and is so fixed that the pressure caused by the action of the  
 “ brake is principally received by it. In conjunction with and



“ attached to the rod or bar is a chain or other convenient connection fastened at the other end to another spring, the said connection if necessary running over or between pulleys or rollers placed at convenient distances on the vehicle; this second spring is fixed at a part of the vehicle most convenient for the brake to be used either by the driver or other person, the said spring being further attached to a handle or foot piece.”

[Printed, 4d. No Drawings.]

A.D. 1866, November 9.—No. 2921.

JOHNSON, JOHN HENRY.—(*A communication from Emile Elie Thiercelin.*)—Coupling. “The essential feature of this peculiar fastening or coupling consists of a stem and a socket combined with a locking and releasing pin. The stem is provided with a curved notch on one side, if intended to remain fixed when coupled, or with an annular curved groove all round it if intended to be capable of rotating or swivelling when coupled. The interior of the socket piece corresponds to the shape of the stem and through one side of it there is passed transversely the locking and releasing pin, which in all cases is of a circular section. This pin has a notch made on one side of it of a corresponding section to the stem to be coupled, the radius of the pin being the same as the radius of the curved notch or curved annular groove in the stem. In coupling or fastening the two parts together the locking pin in the socket is first turned so as to cause its notch to coincide with the interior of such socket; a free ingress is thus afforded to the stem which is now inserted, and when home it is secured in the socket by simply turning the locking pin, so as to bring its solid portion into the transverse notch or annular groove in the stem. To release or uncouple the parts the locking pin is turned back again, so as to bring its notch opposite the stem, when the latter will be free to be withdrawn from the socket. This construction of fastening or coupling is obviously susceptible of numerous applications, such for example as the coupling of railway waggons or carriages, pole chains and splinter bars of vehicles, carriages and other lamp connections.”

[Printed, 8d. Drawing.]

A.D. 1866, November 19.—No. 3026.

MORTON, ELLIS WESLEY.—(*A communication from Ellis Johnson Morton.*)—Elastic tire. “Upon the outside of the tire a  
“ band of india-rubber or other elastic material is placed, the  
“ metal having by preference first been covered with a coat  
“ of red lead and varnish. Another metallic tire is set in the  
“ usual manner over the elastic or yielding material, the  
“ latter being protected from injury by heat while the outer  
“ tire is being set by means of a coat of cement composed of  
“ potter’s clay, borax, and glue, dissolved in water.” “In  
“ case of heavy tires it will be found desirable to use a thin  
“ hoop of metal instead of the cement or composition, or in  
“ connection therewith.” “The outer tire as well as the  
“ inner may have flanged edges or a corrugated, concave, or  
“ converse surface for the greater protection of the elastic  
“ band. The outer and inner tires are united together with  
“ the elastic material interposed, and are firmly secured to  
“ the rim or felloes of the wheel by means of screw bolts or  
“ other suitable fastenings.”

[*Printed, 6d. Drawing.*]

A.D. 1866, November 19.—No. 3028.

EARP, THOMAS, and ASHTON, RALPH.—Doors for cabs and other vehicles. These “improvements are applicable to  
“ Hansom cabs and like vehicles, particularly to such as have  
“ two doors opening upon a vertical or nearly vertical axis;  
“ these doors are of the full height of the cab inside, and have  
“ hitherto been hinged upon a central post, and have opened  
“ against the ‘splash board.’” The invention “consists in  
“ dispensing with the central post and in arranging the doors  
“ upon hinges or pivots, one door at each side of the vehicle,  
“ so as to shut against each other at the centre of the cab,  
“ and when open to cover the wheels of the cab to protect  
“ the clothes of the passengers when getting in and out of  
“ the cab; also in making the hinges to extend from the top  
“ to the bottom of the doors, and thus form a water-tight  
“ joint; also in connecting the two doors arranged as above  
“ described by levers and rods, tooth gearing, and a shaft or  
“ intermediate gearing, or pulleys, rods, chains, straps, or  
“ bands, or other mechanical equivalent, so that when one

“ door is opened the other door will be opened, and when one  
“ door is closed the other door will also be closed, if required  
“ simultaneously.”

[*Printed, 8d. Drawing.*]

A.D. 1866, November 24.—No. 3100.

BOTWOOD, WILLIAM.—Raising and lowering carriage heads. The patentee mounts “in suitable bearings underneath the  
“ seat of the carriage a horizontal axis running from side to  
“ side of the carriage, and this axis is rotated when required  
“ to raise or lower the head by means of a crank handle or  
“ key applied to a spindle with a square or suitably formed  
“ end conveniently placed at the edge of the seat either near  
“ the door or in centre of the carriage this spindle is geared  
“ with the horizontal axis by means of bevelled pinions.  
“ There are also at each end of the horizontal axis other  
“ bevelled pinions gearing with corresponding pinions on the  
“ lower ends of two vertical screws, one on either side of the  
“ carriage; these screws, which are right and left handed  
“ respectively, are concealed by the lining of the carriage,  
“ and are held in suitable bearings. On each screw there is  
“ a nut, which by a link is connected with the main frame or  
“ upper pillars of the head at a distance from the centre  
“ about which it works, and in such manner that when the  
“ nuts are brought to the top of the screws the main frames  
“ assume an upright position, whilst when the nuts are at the  
“ bottom of the screws the frames lie down horizontally, or  
“ nearly so. The carriage may have a head similarly arranged  
“ over each seat, and when both the heads are raised flaps  
“ jointed to the top of each of the main frames turn down  
“ into a horizontal position and complete the roof over head.  
“ If desired the horizontal axis may be arranged to receive  
“ the key at its ends in place of being driven by bevelled  
“ wheels; or it may be geared with a spindle arranged to  
“ receive a key at the back or front of the carriage.

“ The metal hinge or joint connecting the upper pillar with  
“ the body of the carriage is conveniently made with a strap  
“ to receive the end of the connecting rod passing from the  
“ upper pillar to the nut on the screw.”

[*Printed, 1s. 4d. Drawings.*]

A.D. 1866, November 26.—No. 3108.

MORGAN, GEORGE HENRY, and MORGAN, EDWARD.—(*Provisional protection only.*) — “Improvements in carriages.” These improvements relate, firstly, to the construction of carriage heads and to the windows which are fitted in these heads. The inventors propose to dispense with all the hoop sticks and slots except such of the former as are at the angle of the head and over the doorway. The windows are folding.

Secondly in raising and lowering heads by means of coiled springs or levers, arranged according to a modification of the improvements covered by the inventors’ previous patent, dated 28 January 1862, No. 223, or otherwise as described.

Thirdly, to carriage steps. Two forms of folding steps are described. In one “the rising distance from the top step to the carriage” is made less than usual “by fixing the top step by hinge or pin joint immediately under the carriage body, the lower step having levers connected thereto which by links or connecting rods are connected to the top step, thus on closing the door a suitable connection thereupon causes the two steps to be folded one over the other with their tread parts together.” In the second form, one step is drawn inwards under the carriage; the other being turned up by the closing of the door.

Lastly the improvements relate to a spring curtain or blind for windows of carriages having folding heads. The curtain is drawn up instead of down.

[*Printed, 4d. No Drawings.*]

A.D. 1866, November 27.—No. 3124.

CLARK, WILLIAM.—(*A communication from Jules Henry Delaunay.*)—Time and distance indicator. The indicating apparatus is worked by an electric current produced by electro-magnetic apparatus put into motion by the rotation of the carriage wheels. “The apparatus consists of an ordinary clockwork action, with a cylinder escapement actuated by the electric current produced by the apparatus described, and conducted by means of two insulated wires. The number of intermissions or revolutions of the wheel is transformed into miles by means of suitable wheel

“ gearing, and indicated on dial plates, as before mentioned ;  
“ one of these dials which is placed in the inside of the vehicle  
“ near the seat, or in other position so as to be visible to the  
“ passenger, is suitably graduated up to twenty miles, for  
“ example, and fractions of the same, and is furnished with  
“ a disconnector similar to those of printing telegraph  
“ receiving apparatus, by which means the index returns to  
“ zero at the commencement of each journey ; the other dial  
“ plate is furnished with an index mounted on the same  
“ spindle as the former ; this dial is placed under lock and  
“ key, and has no disconnector, consequently it indicates the  
“ whole number of miles travelled in a day. When the  
“ vehicle is unoccupied it is unnecessary for the apparatus  
“ to register distances, in which case a metal or other tablet  
“ is fixed at a visible point outside the vehicle, with the  
“ words ‘for hire’ inscribed, and which is removed and  
“ placed in position by the driver. When the vehicle is  
“ travelling while empty the tablet ‘for hire’ will be exhibited,  
“ the action of which and of a suitable disconnecting gear  
“ will break the magnetic circuit and stop the action of the  
“ indicator. Immediately the vehicle is hired the tablet is  
“ lowered, which action sets in motion a signal and dial for  
“ registering the total number of journeys made by the  
“ vehicle. This tablet or notice board is lowered either to  
“ the right or left hand, according to whether the vehicle is  
“ hired by the hour or by the journey ; in the latter case the  
“ tablet sets the mile indicating apparatus in motion, and  
“ in the other case prevents its action, as the distance  
“ travelled is not required ; but at this moment a horary  
“ indicator with two dials commences to act ; one of these  
“ dials, which is furnished with a suitable disconnector,  
“ reckons the hours occupied by each journey, returning to  
“ zero at each time, the other dial, which has no disconnector,  
“ reckons the time occupied in each journey or hiring made  
“ during the day. The indications may be thus summed up  
“ as follows :—1st, the passenger sees either the number of  
“ miles run or of minutes which have elapsed during his  
“ occupation of the vehicle, while the dial will also indicate  
“ the sum to be paid for such distance. 2ndly, the proprietor  
“ of the vehicle will know how many journeys have been  
“ made in the day, the number of miles travelled, and the

“ number of hours it has been hired. 3rdly, the public will  
 “ always by the tablet or notice board see whether the vehicle  
 “ is occupied or not.” The fares by the journey or by the  
 hour may be always fixed according to formula given by the  
 inventor.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1866, December 4.—No. 3186.

HASELTINE, GEORGE.—(*A communication from John Gould Perry.*)—Pole and shafts. The improvements described in this specification relate to reaping and mowing machinery and include a method of constructing the pole or shaft, which method is applicable to common road carriages generally. The pole is made up of two parts connected at one end by a species of parallel-motion joint and at the other by the cap to which the pole chains are attached. When the shafts are opened they constitute a pair of shafts.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1866, December 14.—No. 3283.

DE NEVIERS, ALBRECHT.—(*Provisional protection not allowed.*)  
 —The following is this provisional specification :—

“ I construct a sledge of any form, shape, or dimension,  
 “ adapted for and capable of conveying persons or other  
 “ objects and subjects, especially for amusements. This  
 “ sledge may be ornamented internally and externally with  
 “ draperies and designs suited to taste or particular represen-  
 “ tation. The sledge is to be provided with and to be  
 “ moved on wheels to be enabled to go easy on other surfaces  
 “ as well as on ice or snow. The wheels may be of an  
 “ uncertain number, as two, three, four, or more fixed under-  
 “ neath or on either side,” and these “ wheels may be con-  
 “ structed of any size and of any substance, such as wood,  
 “ leather, india-rubber, or of any metal.”

[*Printed, 4d. No Drawings.*]

A.D. 1866, December 29.—No. 3418.

NEWTON, ALFRED VINCENT.—(*A communication from Claude Ducru.*)—Releasing horses. “ The invention consists in  
 “ combining with the detaching apparatus a brake, which

“ is applied at the same time that the horse is detached. The  
“ detaching apparatus consists of an oscillating cross bar,  
“ which is arranged directly over the common cross bar and  
“ which is operated from the driver’s seat by a vertical lever  
“ or handle ; the traces or tugs of the harness are secured to  
“ pins, which are attached to the oscillating cross bar, and  
“ the saddle and hold back straps in a one-horse waggon are  
“ held by horizontal sliding bars between uprights which are  
“ attached to the shafts or thills ; by pulling the aforesaid lever  
“ back, the pins which hold the traces are raised out of their  
“ sockets in the stationary cross bar, and the traces are  
“ released, while the horizontal sliding bars are also pulled  
“ back by the same movement, thus releasing the hold back  
“ and saddle straps, and thereby completely detaching the  
“ horse from the waggon. A downward extension of the  
“ vertical lever is connected with a break that operates upon  
“ the hubs of the hind wheels ; and it is operated by the  
“ same movement of the lever which disengages the horse.  
“ In two-horse waggons the whippletrees are disengaged  
“ from the pins on the oscillating cross bar instead of the  
“ traces or tugs in one-horse waggons. The pole straps in  
“ two-horse waggons are secured to and released by a similar  
“ horizontal sliding rod, as the saddle and hold back straps  
“ on one-horse waggons. All other parts are the same in  
“ two-horse as they are in one-horse waggons.”

[*Printed, 10d. Drawing.*]

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## SUPPLEMENT.

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A.D. 1770, February 5.—No. 953.

EDGEWORTH, RICHARD LOVELL.—Endless railway.

“ My invention,” says the patentee, “ consists in making port-  
“ able railways to wheel carriages, so that several pieces of  
“ wood are connected to the carriage, which it moves in  
“ regular succession in such manner that a sufficient length  
“ of railing is constantly at rest for the wheels to roll upon,  
“ and that when the wheels have nearly approached the

“ extremity of this part of the railway their motion shall lay  
“ down a fresh length of rail in front, the weight of which in  
“ its descent shall assist in raising such part of the rail as the  
“ wheels have already passed over, and thus the pieces of  
“ wood which are taken up in the rear are in succession laid  
“ in the front, so as to furnish constantly a railway for the  
“ wheels to roll upon.”

*[Printed, 3d. No Drawings.]*

A.D. 1810, February 26.—No. 3309.

PRATT, MAJOR.—Machinery for agricultural purposes.

Part of these improvements relates to a method of propelling carriages for common roads. On the lower end of the perch bolt is a bevel wheel which gears into another bevel wheel carried on a shaft below the axletree. On this shaft are chain wheels which drive an endless band or framing supported by “extenders.” At intervals on the endless frame are hinged spikes or teeth which, as the apparatus is worked, grasp the ground and so propel the vehicle. The power is communicated to the bevel gearing by means of the rotation of the perch bolt. This is effected by “wind, steam, or other such like mechanical powers.”

*[Printed, 1s. 5d. Drawings.]*

A.D. 1813, April 28.—No. 3686.

MEAD, THOMAS.—Propelling vehicles.

This invention relates to the construction of an engine which may be used for a variety of purposes, among others of propelling carriages. The engine consists in principle of an endless chain carrying at intervals pistons which pass through the cylinder from end to end. Among the applications of this engine illustrated in the specification is a steam carriage for common roads. A vertical boiler, furnace, fuel store, and bellows are carried on the hind axle. In front is a steering wheel. The motion of the engine is communicated to a set of cranks furnished with pushers or legs, shod with iron and hung on the cranks by universal joints. If preferred these pushers or legs may be removed and driving wheels used in their stead. A four-wheeled carriage similarly propelled is also shown.

*[Printed, 1s. Drawing.]*



A.D. 1825, October 6.—No. 5260.

CAYLEY, Sir GEORGE.—Endless railway.

The waggon shown and described in this specification is supported on four main wheels. To the pair of wheels on each side is fitted an endless chain, made up of long bar links, each of which carries a roller the axis of which is at right angles to the axis of the main wheels. The wheels run upon the links of the endless chain; the rollers serve to facilitate turning of the vehicle. Each link of the chain has a wood stop to limit its angular motion. To prevent lateral motion on an inclined surface, disc wheels are fitted to angular bars or axles which may be lowered to the road when required, and the wheels by engaging with the road keep the vehicle from drifting sideways. Instead of these disc or guide wheels, shoes or feet may be fitted to the endless chains for the same purpose.

[*Printed, 10d. Drawing.*]

A.D. 1825, November 1.—No. 5274.

SEAWARD, JOHN, and SEAWARD, SAMUEL.—Propelling carriages.

The propulsion is effected by means of a spiked wheel carried in a swinging frame attached to the carriage. This wheel does no work in supporting the vehicle. The bearings of the wheel axis may rise and fall in circular grooves concentric with the cranked axle or shaft from which the wheel is driven so that the latter may adjust itself to the varying ground levels, or the swinging frame may hinge on the crank shaft for the same purpose. The propelling wheel is driven by a pitch chain from the crank shaft above mentioned. The spiked wheel engages with the ground and by its rotation propels the vehicle.

[*Printed, 7d. Drawing.*]

A.D. 1837, May 11.—No. 7370.

BOYDELL, JAMES, junior.—Propelling carriages.

The specification shows the invention applied to railway purposes, but it is claimed to be equally applicable to common roads. The propulsion is effected by means of pusher bars or props, each of which is connected with the crank pin of a revol-

ing shaft suitably driven by steam or other power. These pushers engage with the ground, and, as their name implies, push the vehicle forward. The Patentee refers to a previous Patent of David Gordon, dated in 1824, and he points out that by his improvements he is able to dispense with separate apparatus for raising the pusher bars or props.

[*Printed, 9d. Drawing.*]

A.D. 1839, August 26.—No. 8207.

PINKUS, HENRY.—Propelling carriages.

This specification, which is of considerable length, relates chiefly to methods of working agricultural machinery by means of power laid on by permanent mains or conduits throughout the estate. The power consists of inflammable or explosive gas or a partial vacuum produced by various means. It also relates to methods of propelling vehicles on common roads by communicating to engines carried by the vehicles the explosive gas necessary for driving them, through mains laid at the road sides. Stations are provided at intervals for the supply of gas which is received into the carriages through travelling valves. The carriages are steered in the usual manner and adhesion of the wheels is secured, when necessary, by studs on the wheels. On soft ground an endless apron of coarse wire gauze is provided. The valves are closed by a coating of cocoa-nut oil or similar fat which is solid at ordinary temperatures, but is softened at the proper time by warmth produced by electrical action. The valve main may be dispensed with where the vehicle may stop at intervals to fill a gas receiver carried with it. The Patentee observes that the details of the mains and impelling engines and apparatus may be varied in form and construction.

[*Printed, 4s. 2d. Drawings.*]

A.D. 1843, July 15.—No. 9842.

RANSOME, ROBERT, MAY, CHARLES, BIDDELL, ARTHUR, and WORBY, WILLIAM.—Whippletrees.

The improvements described in this specification relate to a variety of subjects. They include a mode of constructing whippletrees. This particular improvement is described in various forms, all of which are modifications of the principle

of constructing the article in question of two iron plates or bars bent to form an elliptical or similar figure with a tension bar or truss across the short axis, in the line of draught. The trace attachments, or loops, are at the ends of the long axis. In some cases diagonal or other trussing bars or plates are added. The patentees also explain that a whippetree may be made by uniting together at their bases "two hollow diminishing figures" of iron, forming in fact a tube, diminishing towards either end, of a "circular, elliptic, or any convenient strong figure." Of such whippetrees they say it is evident that they "will have the side next the draught acting as the thrust and the opposite as tension bar, the intermediate connecting parts being of the nature of struts."

[*Printed, 2s. 10d. Drawings.*]

A.D. 1845. March 27.—No. 10,578.

TEISSIER, JOHN BAPTISTE SIMION, and TRIAT, ANTOINE HYPOLYTE.—Propelling vehicles.

The propelling instruments are "paws" or props which engage with the ground and push or hold by the ground. They may be placed in the front or rear of the carriage and are worked by means of a crank shaft driven by power. Each "paw" is attached to a crank pin.

[*Printed, 1s. Drawings.*]

A.D. 1846, January 3.—No. 11,024.

SWINBURNE, THOMAS.—Carriage for road and railways.

The improvements described in this specification include a vehicle for use on rail and common roads. This vehicle consists of a cylinder, having a door at some part of its periphery, and at each end a flanged tire to run upon the rails. An axle arm at each end serves as a means of attaching the hauling power through shafts or otherwise. To enable these vehicles to run upon common roads, a "cap" is placed round the tire, filling up the latter to a level with the flange, thus making an even tread. The cap is made in two parts, so as to be easily removable without lifting the cylinder end from the ground, and is secured by bolts and "linch pin."

[*Printed, 10d. Drawing.*]

A.D. 1846, January 15.—No. 11,040.

LEAHY, EDMUND.—Endless railway.

This endless railway consists of a chain of short lengths of rail, each of which length is furnished with two feet which bear upon and hold the ground. At the junction of each pair of rails or lengths is a friction roller. If the wheel has an elastic tyre under one modification, the friction roller is of the common type and runs upon the tire. If no elastic tire be used, under another modification, the rollers themselves are made elastic by supplying them with a spiral or volute-shaped spoke. The endless chain of rails is carried round the carriage wheels either with or without the help of rollers attached to the carriage body or framing.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1847, January 19.—No. 11,537.

McINTOSH, JOHN.—Propelling carriages.

For this purpose a wheel is converted into a kind of rotary engine. A flexible tubular tire is fitted to the periphery. Steam is introduced into the tire through the axle and a tubular spoke, and pressing in one direction against a fixed abutment in the tire and in the other direction on the ground by means of the expansion of the tire, causes the wheel to rotate. The exhaust is effected through a similar tubular spoke.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1847, October 14.—No. 11,907.

LILLIE, Sir JOHN SCOTT.—Endless railway.

This invention chiefly relates to apparatus for tillage purposes. It includes also an endless railway which is said to be useful also for facilitating the passage of carts and other vehicles over soft ground. This railway consists of "planks" of wood or other suitable material, united by iron hinges, "or of wrought iron plates hinged to each other so as to turn freely over square staves or drums and circulate around the bearing wheels of the carriage," a pair of staves or drums being placed at each side of the carriage. The improvements also include a "whelp" or rope drum, consisting of a poly-

gonal drum carried on a wheel, and a method of raising bearing wheels from the ground by a screw.

[*Printed, 1s. 2d. Drawings.*]

A.D. 1850, November 2.—No. 13,309.

DE NANTEUIL, PIERRE ANTOINE AUGUSTE DE LA BARRE.—  
Propelling carriages.

The propulsion is effected by means of a curved or knee'd lever, the bend of which engages with the ground. As shown in the drawing, it resembles in shape a fish-hook. It rocks on a pivot placed about half way in the shank. The upper end of the shank is moved to and fro by a steam impelled piston. Thus the effect of a forward stroke of the piston would be to rock the lever on its pivot, press the bend of the lever on the ground, and so tend to lift the carriage upwards. This lift is converted into forward movement by means of a rail or horizontal bar which passes between rollers on the point (to preserve the fish-hook simile) of the lever.

This is the principle of the invention; the means of carrying it into effect are described at length. Provision is made for turning or steering movements, by means of which the horizontal rail or bar does not move out of the straight line so long as the lever is on the ground. The leading wheels hang on separate axles, and are capable individually of pivoting round a vertical axis. The wheels of the carriage are free on their axles.

[*Printed, 1s. 3d. Drawings.*]

A.D. 1852, June 28.—No. 14,193.

COLEMAN, JAMES EDWARD.—(*A communication.*)—Spirings of india-rubber.

This specification, with the drawings attached thereto, describes a large number of applications of india-rubber to springs. The india-rubber is generally used in the form of annular or solid blocks, and excessive compression is prevented by surrounding them with metal rings or cylinders. In the case of annular blocks, water and air may together fill the cavity. Secondary elastic cylinders or blocks may be used for the purpose of obtaining a non-recoil action. Spiral springs are also used in combination with these blocks. Amongst the

applications of this system described and illustrated in the drawings are bearing buffer and draw springs for carriages, and packing or side pieces for carriage windows for preventing vibration.

[*Printed, 1s. 5d. Drawings.*]

A.D. 1853, May 12.—No. 1172.

GOBLE, GEORGE FREDRIC.—Propelling vehicles.

The invention is described in its application to the propulsion of vessels, but it is claimed to be useful for propelling vehicles on roads. The apparatus consists of an endless chain having paddles or float boards at intervals. These are immersed in the water, or, in the case of vehicles, press on the ground.

The specification also describes a coupling, useful for carriages. It consists of two serrated bars held together by a clip.

[*Printed, 8d. Drawings.*]

A.D. 1855, November 9.—No. 2521.

RAYWOOD, JOHN.—Drilling, sowing, and harrowing machines.

In this machine the dibbles are carried upon an endless band made up of bar links of wood or metal united by elastic straps, the whole passing round the running wheels. This endless band forms, in fact, an endless railway upon which the machine runs, and its use is claimed for carts and other vehicles. The specification also describes a method of applying springs to the wheels of the machine. Above the bearings of the axles are spiral or buffer springs carried in housings and put into compression by a vertical rod attached to the upper bearing.

[*Printed, 7d. Drawing.*]

A.D. 1856, February 9.—No. 345.

DUNCAN, JOHN WALLACE.—Propelling rafts, &c.

The improvements described in this specification relate to numerous subjects. They include a method of propelling rafts on water, which is also applicable to similar purposes on land or ice. The propulsion is effected by means of longitu-

dinal cylinders round which are spiral screw blades. These engage with the ground, and the cylinders and screws being conical or tapered towards the end, the raft is enabled to pass inequalities in the ground and ascend hills. Transverse bearing rollers are also fitted to the raft, and these are capable of being raised from or lowered to the ground. By this means the screws may be wholly lifted from the ground, and the cylinders may, if preferred, be themselves driven by power.

[*Printed, 3s. Drawings.*]

A.D. 1856, August 18.—No. 1926.

CAMBRIDGE, WILLIAM COLBORNE.—(*Provisional protection only.*)—Portable railway.

The inventor says “In making my portable railway I construct it of broad plates or sheets of iron, which will have an extensive bearing on the surface of the ground, so that on a soft soil the carriage may be supported on the surface without sinking in. On the top and along the centre of these plates or sheets is fixed a raised rail of such a length as to admit of the several successive lengths of rail meeting or abutting against each other, end for end, so as to form a continuous rail under the wheels. I propose that the broad plates or sheets of iron be provided at each side with flanges or angle iron, to prevent the earth from squeezing over the edges of the plates, and being lifted thereby. The several sections or parts of which the portable railway is composed are connected to centres, by means of arms, which as the carriage advances lay down the sections successively in front of the wheels, and take them up again when the wheels have passed over.

[*Printed, 3d. No Drawings.*]

A.D. 1857, February 12.—No. 414.

BLACKBURN, ISAAC and BLACKBURN, ROBERT.—Steam carriage or traction engine.

This invention consists in placing the whole of the propelling machinery within a large drum, in such manner that the engines being suspended upon the axis or from the trunnions of the drum, cause the latter, by means of toothed gear, to

rotate around them and so progress. A small wheel mounted in a frame carried out from the framing serves as a steering wheel, and may be turned over to act as a guide either before or behind the machine. A water tank is placed on the frame round the drum and water is drawn from it through one hollow trunnion to the feed pump. The regulator is worked through the opposite trunnion and a feeding hopper is provided for fuel.

[*Printed, 1s. 10d. Drawings.*]

A.D. 1858, June 21.—No. 1392.

ANDERSON, Sir JAMES CALEB.—Locomotion.

The Patentee makes wheels suitable for running on rail and common roads. These wheels have flanges three or four inches broad; the rest of the tire is conical. The latter part runs on rails, the former on the road, as the case may require. To facilitate the ascent of hills, he puts wheels of smaller diameter within the gauge of the driving wheels and when the hill is reached, the smaller wheels run on a timber tram laid for the purpose. The wheels and tram may be cogged. In the case of tramway carriages which may be required to run on roads, steering wheels are provided. Guide rails of T-section are also placed on tram or common roads, to facilitate ascent and enable higher velocities to be attained.

A modified endless railway for carriages is also described. It consists of a large wheel upon the concave or inner surface of which the smaller and bearing wheels of the carriage run. The inner surface of the large wheels may be polygonal if preferred.

Brakes are applied to the large wheels. These brakes consist of segmental bands, lined or not with wood, and put on by means of the action of pins in angular slots.

He also describes a method of propelling by means of the "weight of gravitation" by the carriage.

[*Printed, 5d. Woodcuts.*]

A.D. 1859, January 14.—No. 127.

ROMAINE, ROBERT.—Portable railway.

To obviate rapid destruction of the ends of the rail sections and to promote smooth running, the Patentee mounts two or



more pairs of carrying wheels on the same axle and fits each wheel with its endless railway, so that he ensures “ the placing “ on the ground of a rail of one set for its wheel to bear upon “ before the pressure of the adjacent wheel is taken from its “ railway.” On to the same wheel there may be applied a double set of rail sections, the wheel being proportionately broad and slotted to provide for the sleeper attachments. Two wheels may be fitted on one nave, cast in parts and bolted together with a lubricating cavity within.

[*Printed, 10d. Drawing.*]

A.D. 1859, May 30.—No. 1333.

BLACKBURN, ISAAC, and BLACKBURN, ROBERT.—Traction engines.

The improvements are thus described by the Patentees : They “ are based upon an invention for which Letters Patent “ were granted to us on the 12th February 1857, No. 414, and “ consist in several new arrangements hereafter described. “ We connect rigidly to the trunnions of the large travelling “ drum supporting the boiler, or to a shaft supported in the “ centre thereof, a frame, which is brought out to the front “ or back of the drum, and forms a lever whereby the drum “ may be turned and guided. The frame also supports steam “ cylinders, and instead of driving the drum from the inside “ as before, we drive from the outside by means of toothed “ gear. We place the boiler inside the drum and convey “ steam therefrom to the cylinders through one of the trun- “ nions on which it is supported, and feed the boiler through “ the other. Or, we mount the boiler as well as cylinders on “ the frame outside the drum, and place the water tank and “ fuel bunker inside the drum. Instead of constructing the “ surface of the drum of smooth plates, we form it with “ corrugated plates, or other suitable uneven surface, which “ will cause it to grip and not to slip on the soil. When for “ travelling on rails, we apply suitable flanged tyres on the “ drum. We also construct the pinions for driving the drum “ in such manner as to allow them to slip backwards and “ forwards on their spindles, in order to drive the drum from “ one or both sides, and to take them entirely out of gear, in “ order that the drum may remain stationary while the en-

“ gine is being used for hauling implements, or for threshing,  
 “ or otherwise.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1859, June 9.—No. 1402.

BURNESS, WILLIAM.—Steam culture and cartage.

These improvements relate almost entirely to apparatus for steam cultivation, a subject which is not covered by this series of abridgments. It includes, however, an improved arrangement of engine and boiler in a traction engine. These parts are placed “ in framing, having bracing straps of its own, “ exclusive of straps coiled on to the rivet joints, so that the “ cylinder, connecting rods, crank shaft, fly wheel, pumps, “ hauling apparatus, and other parts, are supported by this “ framing, instead of by the boiler and rivet joint straps, the “ boiler at the same time increasing the strength of the “ whole.” The framing may “ extend beyond each end of the “ boiler, so as to permit the axles of the running wheels being “ placed sufficiently far asunder as to admit of more powerful “ hauling apparatus being placed between them.” “ The “ framing may also rise above the boiler at each side and “ may support a carriage or van, or the like, for the convey- “ ance of manure, farm produce, as also coals, water, steam- “ culture tackle, &c., &c., from place to place.” By means of a gin the engine may be made “ to load and unload itself.”

[*Printed, 11d. No Drawings.*]

A.D. 1859, September 28.—No. 2192.

DORNING, WILLIAM JOHN.—(*Provisional protection only.*)—Traction engines.

The invention consists, firstly, in supporting the driving machinery on framing independent of the boiler; secondly, in supporting the boiler upon trunnions to preserve its level; thirdly, in raising or lowering the ends of the boiler by gearin; driven from the axle of the traction wheel.

[*Printed, 3d. No Drawings.*]

A.D. 1860, April 9.—No. 891.

AVELING, THOMAS.—Steering traction engines.

The invention “ consists simply of one or more steering

“ and supporting wheels carried at the lower end of a vertical  
 “ rod, which is supported in a cross bar fitted to the front  
 “ end of the ordinary horse shafts when applied to engines of  
 “ this class. The steering wheel or wheels are guided by  
 “ means of a long lever handle fitted to the upper end of the  
 “ vertical rod, and extending back to the front of the engine,  
 “ at which end it is provided with a long crosshead and three  
 “ or more handles, so that the attendant may have greater  
 “ command over the steering wheel or wheels. The support  
 “ which carries the steering wheel may be easily removed  
 “ from the shafts when it is required to use horses, and re-  
 “ placed again at pleasure.”

[*Printed, 8d. Drawing.*]

A.D. 1860, May 17.—No. 1227.

CLAYTON, NATHANIEL, and SHUTTLEWORTH, JOSEPH.—  
 (*Provisional protection only.*)—“ Improvements in portable and  
 “ traction engines.”

The following is the provisional specification:—“ This  
 “ invention has for its object improvements in portable  
 “ engines to render them more efficient for traction purposes,  
 “ and consists in suspending the boiler to the main axle, or  
 “ placing the axle above the centre of the boiler.

“ This arrangement involves the necessity of larger travel-  
 “ ling wheels, which is a great advantage for locomotion,  
 “ and rendering the application of the power more simple  
 “ and direct. The peculiarity consists in suspending the  
 “ boiler to the main axle, and placing the same above the  
 “ centre of the boiler.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, May 29.—No. 1328.

PATERSON, ALEXANDER JOHN.—Traction engines.

This invention relates to imparting motion to agricultural  
 traction engines. For this purpose the front of the engine is  
 fitted with lazy tongs having anchors or other gripping ap-  
 paratus attached thereto. The tongs are extended and after  
 the anchor or other apparatus has fixed itself to the ground,  
 the tongs are contracted and so propel the engine. During

the process of contraction other lazy tongs are extended for the purpose of taking fresh hold.

[*Printed, 7d. Drawing.*]

A.D. 1860, June 2.—No. 1358.

AUSTIN, JAMES. — (*Provisional protection only.*) — Traction engines. After describing the vertical boiler, which has outside and inside flues and branch tubes for the purpose of giving a large heating surface, and stating that on the outside of the boiler is bolted a ring of angle iron, the inventor proceeds thus:—"This outer ring has two plates riveted to it and arranged parallel to each other; from the centre of these plates are hung two guides between which the pedestal bearings of the main axle slide, a helical spring being placed above each bearing. On the extremities of the main axle are fitted the bearing wheels, which run loosely on the axle, and the parts connected with these wheels are so arranged within a second horizontal ring as to admit of their acting as steering as well as bearing wheels. The engine for imparting the propelling power is fitted on the upper part of the boiler, the cylinder being arranged horizontally. The rectangular frame on which the engine is fitted has a vertical stud in it which carries the horizontal fly-wheel; a pin is screwed into the nave of this wheel which forms the crank and to which the connecting rod is attached. The crank pin is made duplex, that is to say, it is bent at the part above the connecting rod in a horizontal direction, and again vertically, to which part the spindle of the slide valve motion is attached. The rim of the fly-wheel is all on the lower side of the wheel, and it gives motion by frictional contact to a pinion on the upper end of a vertical shaft, the bearings of the shaft being adjustable so that the pinion may be regulated as regards its pressure on the rim of the fly-wheel. A worm on the lower part of the vertical shaft gives motion to a worm wheel on the main axle, and this motion is communicated by means of arms which are keyed thereto to pins in the naves of the wheels. The peripheries of the driving wheels are fitted with curved springs or prongs, which enter the

“ ground as the machine is propelled along, and so give it an  
“ increased hold on the ground.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, September 25.—No. 2326.

HAWORTH, JOHN.—Carriages for tramways.

The invention relates partly to the construction of tramways, and includes the laying of a central or third rail which is grooved.

The improvements in carriages “ relate to those intended to  
“ run on tramways or rails similar to those above described,  
“ and consist in the application thereto of a pulley or wheel  
“ or disc, the circumference of which runs in the groove in  
“ the intermediate rail, and is supported by a stud or axle  
“ connected by two diagonal stays or otherwise to the front  
“ axle, or other convenient part of the carriage. When the  
“ carriage is running along a straight or nearly straight road,  
“ the circumference of the wheel or disc is in the groove in  
“ the intermediate rail, and keeps the wheels of the carriage  
“ on the outer rails, but in turning a corner, or when it is  
“ otherwise necessary to deviate from the straight line, it is  
“ lifted out of the groove by a treadle or other apparatus, so  
“ as to set the carriage at liberty and free to turn in any  
“ direction.”

[*Printed, 1s. 1d. Drawings.*]

A.D. 1860, October 8.—No. 2441.

JOHNSON, JOHN HENRY.—(*A communication from William Wharton, junior.*)—Tramways and carriages.

The object of the invention is to dispense with turn-tables and moveable points. “ It is proposed to make the points  
“ on those parts of the way where a siding or branch runs  
“ out of the main line in such a manner as to remain always  
“ open, whether for the through traffic on the main line or  
“ for the branch traffic, and in conjunction with these per-  
“ manently open and fixed points is laid a guide rail so  
“ disposed that by imparting a lateral thrust to the wheels  
“ of the carriage intended to be transferred to the siding or  
“ branch, those wheels will be caused to leave the main line  
“ and enter the branch line.

“ In carrying out this invention it is proposed to make  
“ those wheels of the carriage to be transferred, and which  
“ are on the side of the line next to the guide rail, of a  
“ greater width than usual, so that as they pass the guide  
“ rail (which should stand up higher than the ordinary rail)  
“ they will be forced or pushed by it laterally into the branch,  
“ the flanges of the wheels passing through the open points.  
“ The guide rail may be placed either inside or outside of the  
“ line of rails, and the wheels to be acted upon by them may  
“ have annular projections or rims formed upon them, or  
“ special wheels for the guide rails to act upon may be em-  
“ ployed. Those carriages which are not required to leave  
“ the main line are provided with the ordinary railway  
“ wheels, and consequently they will not be acted upon by  
“ the guide rails, but will pass the points without leaving  
“ the main line.”

[*Printed, 7d. Drawing.*]

A.D. 1860, October 25.—No. 2601.

RICHARDS, JOHN. — (*Provisional protection only.*)—Brake.  
The inventor says, “ on one of the wheel axles of the carriage  
“ a cast or wrought iron disc is keyed, the said disc having  
“ a portion of its periphery cut away so as to form a large  
“ tooth similar to the tooth of a ratchet wheel. A spindle  
“ turning in brackets on the under side of the carriage or  
“ truck carries at one end an arm, the end of which said arm  
“ is turned so as to make a right angle with the said arm.  
“ The hooked end or catch of the arm is situated immediately  
“ over the before-mentioned disc. The said arm is so con-  
“ nected to its spindle as to allow sufficient rise ” to clear the  
depth of the tooth on the disc without moving “ the said  
“ spindle. At the other end of the spindle is a lever working  
“ against the side of the carriage or truck under an iron  
“ guard. By means of the said lever the hooked end or catch  
“ of the arm may be thrown out of gear. On the two-wheel  
“ axles of the carriage or truck discs having teeth in opposite  
“ directions may be placed, and suitable catches provided to  
“ engage with these discs respectively. By connecting the  
“ levers of the two catches, one or other of the said catches  
“ may be thrown into gear, or both of them may be thrown

“ out of gear with their respective discs. By this arrangement the carriage or truck may be prevented from moving in either direction as required without turning the said carriage or truck. The action of my new or improved brake is as follows:—That one of the catches is thrown into gear which will allow of the rotation under it of its disc in the direction in which the wheel axle is required to move. The catch rests upon the periphery of the disc, and when the carriage or truck moves in the proper direction the tooth on the disc passes under the catch without obstruction, but when by the breaking of a coupling, or otherwise, the carriage or truck commences to move in the opposite direction or backwards, the catch engages with the tooth, and thus preventing the rotation of the wheel axle brings the carriage or truck immediately to rest.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, October 26.—No. 2619.

PRENTISS, ELIJAH FREEMAN.—Carriage for tramways.

The improvements consist firstly, in supporting the roof upon angular struts, abutting at one end on the side framing and bearing at the upper end against a king post. The upper ends support a horizontal bar and the sides are tied together. Thus the roof is supported on the bow and string principle. If not intended to carry passengers it may be supported on the curb principle or from below. Secondly, in strengthening the lower part of the carriage by the use of a “hog chain.” Thirdly, in a method of attaching the pole by means of a vertical swivel pin, so that it may move in a horizontal arc without turning the carriage, and it is so arranged as to allow for a certain amount of vertical motion without interference with the horses. Fourthly, in constructing wheels of cast iron concave on both sides, with a slight elevation in the centre to receive the nave, and with strengthening ribs arranged radially. Fifthly, in an arrangement of axle box having a moveable sliding top, by means of which the usual antifricition bearing may be removed.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1860, October 27.—No. 2620.

HATHAWAY, CHARLES.—Street railways and wheels for use thereon.

Part of the invention relates to a method of causing tramway carriages to turn off the track “by making the wheels of  
“ some of the carriages with thick flanges, and others with  
“ thin flanges, the track and turn-out being made with  
“ grooves, gutters, or rails to correspond.”

[*Printed, 10d. Drawing.*]

A.D. 1860, November 24.—No. 2890.

FOX, SAMUEL MICKLE.—Tramways and wheels.

To avoid the inconvenience to ordinary traffic caused by grooved tramway rails, the inventor proposes to use one grooved rail only in each pair. On each axle there is one flanged wheel and one plain; the flange is in the centre of the tread of the tire.

[*Printed, 6d. Drawing.*]

A.D. 1860, November 29.—No. 2931.

DARLEY, WILLIAM.—(*Provisional protection only.*)—Portable steam engines.

“The improvements relate,” says the inventor, “first, to  
“ giving facility for the turning of the fore wheels. For this  
“ purpose the axle of each of the fore wheels is carried by a  
“ separate upright shaft, and upon each of these upright  
“ shafts is fixed a segment of teeth taken into by a screw  
“ wheel, and these have simultaneous motion given to them  
“ in the direction desired from a main axis. Secondly, the  
“ improvements have for their object means for adjusting  
“ the level of the boiler when moving or standing on uneven  
“ ground. For this purpose the fore end of the boiler is  
“ suspended by screw connections from the fore axle or axles  
“ in such manner that by turning one part of the screw con-  
“ nection in one direction that end of the boiler will be raised,  
“ whilst from the opposite direction the boiler will be lowered  
“ at that end; and I prefer to suspend the fore end of the  
“ boiler by the screw connection from a spring sustained by  
“ the fore axle or axles. By these means facility will be



“ given for the use of the engine, either as a traction or as a stationary engine for agricultural purposes.

“ When used as a traction engine the pinions on the crank shaft will be in gear with toothed wheels on the main wheels on their axis ; and when used as a stationary motive power engine, the pinions on the crank shaft will be slid out of gear with such toothed wheels, and this sliding of the pinion separately or together I obtain by sliding the bearings of the crank axle.”

[*Printed, 3d. No Drawings.*]

A.D. 1860, December 1.—No. 2953.

AUSTIN, JAMES.—Traction engine.

Part of the invention relates to ploughing machinery, the rest to a traction engine suitable also for propelling the ploughing machinery.

The boiler is vertical, stayed and provided with internal and external flues to obtain large heating surface. About half way up the boiler is bolted a ring of angle iron, with eight radial arms supporting a ring of larger diameter. The bearings of the main axle are hung in guides from the radial arms, helical or ordinary springs being placed above the bearings. The wheels are loose on the axle and “ the parts connected with these wheels are so arranged within a second horizontal flanged ring as to admit of their acting as steering as well as bearing wheels.” The engine is fitted on the upper part of the boiler, the cylinder being arranged horizontally in the chimney. There is a horizontal fly-wheel. This gears with a pinion which in its turn drives the main axle by a worm. The peripheries of the driving wheels have “ curved springs or prongs ” which hold the ground. The engine may be made part of a waggon by dispensing with the fore or locking wheels of the latter and bringing forward side or coupling bars to the engine. A modified arrangement consists in fitting a rectangular frame round the boiler on radial arms. A steering wheel or pair of wheels is placed in front, and a pair of driving wheels behind. A differential speed attachment is provided for use in ascending hills.

[*Printed, 6d. No Drawings.*]

A.D. 1861, January 4.—No. 23. \*

HORE, WILLIAM HENRY.—(*Provisional protection only.*)—Distance indicator.

The invention is described in its application to the measurement of fabrics which are passed between rollers provided with indices or counters capable of being set by hand. In carriages the rotation of the nave or axle imparts the motion. The passenger may set the indices before starting and other sets may be provided for the driver and owners.

[*Printed, 3d. No Drawings.*]

A.D. 1861, March 18.—No. 676.

ARROWSMITH, JOHN.—(*Provisional protection only.*)—Street railways and carriages therefor.

A system of toothed rails is described. The engine of the locomotive carriage is under the seat. The driving wheels are driven by frictional gearing. These wheels have toothed rings which engage with the wheels, or there is a toothed disc on the axle which engages with a central toothed rail. The cylinders may, if preferred, be placed outside the carriage, and drive directly on to the wheels by crank pins. The driving and trailing wheels are coupled. The cylinders have long slides worked through packed joints by the pistons. Steam is expanded at atmospheric pressure at the end of the stroke to prevent noisy exhaust. The boiler is placed under the seats of the second carriage, or under the first carriage between the engines. A fan is used to make a draught. To facilitate passage of curves, the axle is made in two halves with a central coupling. Brakes are caused to act on the rails. The engines and the framing and bodies of the carriages as far as practicable are to be of steel.

[*Printed, 3d. No Drawings.*]

A.D. 1861, April 4.—No. 830.

SHEPARD, WILLIAM ALBERT.—(*Provisional protection only.*)—Tramways and wheels therefor.

One form of rail has a central rib; another a central groove. For the former a wheel is used having a flange on each side of the periphery. These flanges run on the rail, the central part of the tread runs on the rib. The wheel is

divided in halves in a plane at right angles to the axle ; thus each half and its flange is free to turn independently of the other in passing curves. When the grooved rail is used, the wheel has a central rib instead of the two flanges. A guide bar with small running wheels pressed down on the rail serves to steady the carriage when the main wheels are passing over obstructions. A wire brush fitted to the guide helps to clear the rail.

[*Printed, 3d. No Drawings.*]

A.D. 1861, July 12.—No. 1757.

ADAMS, WILLIAM BRIDGES.—Carriages for tramways, &c.

The engines and carriages described in this specification are chiefly intended for railway purposes, but carriages are also mentioned as useful for tram and common roads.

The improvements relate to a radial arrangement of axles, effected by the use of curved horn plates and axle boxes. Also to the construction of carriages for sharp curves, in which the wheels are loose on the axles, the latter being plain shafting without collars. A wood tube preserves the wheels in gauge, and the latter are hollow and of cast iron. The axles are lubricated by oil floating on water. The ends of the plate springs are cranked or turned up to clip the shoes on the framing. Volute springs are applied to the buffer bars. For very sharp curves a waggon may be in two parts hinged together. Wheels are made with convex treads, to run on rails or off. A circular spring may be placed between the tire and the wheel.

[*Printed, 1s. 1d. Drawings.*]

A.D. 1861, October 15.—No. 2568.

GILBERT, JOHN.—Endless railways.

The purport of this invention is to facilitate the transport of vehicles over irregular ground. “ Firstly, in order to obtain  
 “ this object, rails and sleepers are connected by brackets to  
 “ an endless elastic steel band passing over two guide wheels  
 “ placed on the inside of the driving or other wheel. The  
 “ clogs or sleepers forming the bearings of the endless way  
 “ overhang the said elastic band, and the rails which are in  
 “ short lengths bear at their joints on the said sleepers, and  
 “ form the tramway on which the carriage wheels run.

“ Secondly, the said elastic steel band may be connected by means of arms to an inner elastic and endless band which passes over pulleys supported by beams resting on the carriage axles, as before described. The said arms would be connected to the said outer and inner bands by joints at their ends, thus allowing them to assume a radial position. Thirdly, the endless elastic band may have the clogs or sleepers fastened directly to it, in which case the carriage wheel would carry a spur wheel at its side, gearing into a rack placed at the side of the rails, and a wheel mounted over the carriage wheel pressing on the elastic band must be used to keep the rack in gear with the spur wheel, or the said rack and spur wheel may be dispensed with by using a V-section of rail and the tire of the driving wheel of a corresponding section. Fourthly, the said elastic band may work in a horizontal position, passing round two horizontal riggers on the lower ends of two vertical shafts, one placed in advance of and the other in rear of the carriage wheel. In this case three courses of rails in short lengths (of a rectangular section) are arranged so as to break joints, and are connected each length at its centre to the said endless band. The carriage wheel runs on the top course of said rails, and the sleepers are secured to the bottom course. The said horizontal riggers are raised sufficiently above the ground to prevent the endless way from touching it except when under the carriage wheel.”

The apparatus is shown applied to an engine having a vertical boiler, with a central fire box and central flues so as to dispense with a chimney, a pair of cylinders driving a crank shaft geared with the axle of the leading pair of wheels. The vehicle is steered from the hind axle. Waste steam is blown in the ash-pit after passing through a feed water heater, thus obviating a noisy exhaust.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1861, November 22.—No. 2931.

YARROW, ALFRED FERNANDEZ, and HILDITCH, JAMES BRACEBRIDGE.—Steam carriage.

This carriage has outside cylinders bolted to the main framing. To the bearings of the driving wheels are attached links, the other extremities of which are fastened to the

framing or to the cylinders respectively; thus the "proper distance between the driving axle and cylinder is maintained, and also play allowed to the springs." The seats for passengers are placed in front of the boiler, which is fitted, if vertical, behind, and, if horizontal, over the driving axle. Behind the boiler are the bunkers, water tanks, &c.

[*Printed, 6d. Drawing.*]

A.D. 1862, February 5.—No. 307.

LEE, JESSE.—(*Provisional protection only.*)—Traction engines.

"This invention consists in placing the axle on which the traction wheels of the engine are mounted about the centre of the length of the boiler, so that said boiler may be balanced across said axle, and one end of the boiler be raised or lowered by a lever when going down or up hill, for the purpose of keeping the boiler as near as may be level at such times."

[*Printed, 4d. No Drawings.*]

A.D. 1862, May 5.—No. 1341.

ADCOCK, JOHN.—"Measuring and indicating distances travelled by wheel carriages."

At every rotation of the nave of one of the running wheels a projecting stud makes one stroke of an air compressor, which by means of an elastic tube communicates with the indicating instrument. Here a wheel is caused to advance one tooth at every wave impulse, and the result is shown either by the projection of a stud at the end of every mile, or by hands on a dial, or by indications of distance seen through an aperture in the front of the instrument.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1862, September 9.—No. 2480.

SELBY, FRASER.—Traction and other engines.

Part of the invention relates to traction engines which are driven by spur gearing and consists in making the driving axle in three parts, viz., a central part rotating in fixed bearings and to which the gearing is attached, and a part at each end, each carrying a wheel and connected with the central

section by a Hook's joint. By this means the vibration of the bearing springs is compensated for.

The rest of the improvements relate to the arrangement of compound engines for traction and other purposes.

[*Printed, 2s. Drawings.*]

A.D. 1862, September 10.—No. 2490.

BARCLAY, ANDREW.—(*Provisional protection only.*)—Traction engines.

The invention relates partly to improvements upon an invention for which letters patent were granted to the present inventor, dated 10th March 1862, No. 646. Under one modification, the crank shaft of each pair of engines has its bearing at one end fixed to the framing whilst the other end is connected with the main axle or the centre of the driving wheel. This vibration of wheels over rough ground is rendered immaterial. "The driving wheels are arranged one  
" with a long tubular axle to which the wheel is keyed, and  
" extending across the framing; the other wheel is fitted with  
" an axle, which passes through the tubular one, and is  
" fastened by a nut. Or the two axles may be arranged  
" parallel, to rotate in contact, and thus obtain an extended  
" bearing surface when the engines are driven at different  
" speeds. The traction engine is coupled to the vehicle  
" accompanying it by a T-shaped connecting piece, which is  
" carried on a vertical spindle, its prolongation passing  
" through two bushes carried by the framing of the con-  
" nected carriage. This arrangement admits of the lateral  
" and vertical movements of the coupled engine and vehicle.  
" The traction engine may also be guided as well as regulated  
" in speed by means of a duplex break action, which is  
" operated by a single-hand lever, so that the motion may be  
" checked or the break applied to either side of the machine,  
" and so guide it by the different speeds of the driving  
" wheels."

[*Printed, 4d. No Drawings.*]

A.D. 1863, January 9.—No. 76.

GOUPIL, EDMOND ALFRED.—(*Provisional protection only.*)—  
" An improved locomotive apparatus."

The object of the invention is “the application of the sphere  
“ for moving furniture to vehicles used to transport cumbrous  
“ material, and to locomotion generally.”

The inventor proposes to use a sphere placed in a socket, and confined therein by a cap which only allows a small segment of the sphere to project, and it is upon this projecting portion that the object to be moved bears.

[*Printed, 4d. No Drawings.*]

A.D. 1863, January 12.—No. 99.

NEWTON, WILLIAM EDWARD.—(*A communication from Perry Dickson and William Ashley Jones.*)—Driving gear.

For driving traction and other engines, dogs or pawls are caused to engage with the inner surface of the rims of the driving wheels. These dogs are fitted to the end of rocking arms or levers, a pair to each wheel, so that one is always in work. In order to vary the application of the driving power, one end of the connecting rod is attached by a moveable joint to a vibrating rod, actuated by the piston rod. “The joint  
“ of the connecting rod is capable of being moved along the  
“ vibrating rod by means of suitable gearing and its arc of  
“ motion, and consequently the power exerted will be in-  
“ creased or diminished thereby at pleasure.”

This method of varying application of power is said to be applicable to any propelling mechanism. For instance, the rods which, in the apparatus above described, communicate reciprocatory motion to the rocking levers carrying the dogs, may act directly upon the ground as alternate pushers.

[*Printed, 6d. Drawing.*]

A.D. 1863, April 1.—No. 836.

ROWLAND, ISAAC.—“Apparatus for measuring and register-  
“ ing the distances public vehicles or private carriages  
“ travel.”

According to the Patentee “this invention consists in  
“ attaching to the nave of one of the wheels a pin and flange  
“ wheel for giving intermittent motion to an intermittent  
“ wheel on a shaft working in bearings, in a box or chamber  
“ attached to the spring or axle. To the shaft of the inter-

“mittent wheel I fix a pinion gearing into a toothed wheel, on the shaft of which there is a pinion gearing into a wheel called the mileage wheel, which is varied in diameter and number of teeth, according to the size of the driving wheel of the vehicle. One revolution of the driving wheel moves one tooth of the mileage wheel, which movement is transmitted by a pinion on its shaft to a series of wheels and pinions communicating motion to fingers in connection with an ordinary clock dial, each division corresponding with the hour on the dial representing the distance of a mile, the diameter of the driving wheel being marked on its face. On the shaft corresponding with the hour hands there is a pin wheel giving motion to an intermittent wheel which acts by means of pinions and wheels upon an additional finger, and moves it backwards a distance corresponding with a minute on the dial for each time the mile finger has traversed the circle of the dial. This additional finger I call the proprietor's finger, as it enables him to check the number of times the mile hand has traversed the circle of the dial. The shaft of the first intermittent wheel is provided with clicks and ratchet wheels in order to prevent a backward motion of the vehicle from having any effect upon the mileage wheel and fingers.”

[*Printed, 10d. Drawing.*]

A.D. 1863, April 7.—No. 880.

HOWARD, JAMES, BOUSFIELD, EDWARD TENNEY, and PINNEY, JOHN.—Propelling and steering traction engines.

The improvements described in this specification chiefly relate to machinery for steam cultivation, but part is expressly stated to be applicable to road and traction engines generally. In describing the hauling engine the Patentees say “for making the engine self-propelling, a mitre or bevil wheel keyed on the rear end of the crank shaft gears into and drives a similar wheel keyed on a transverse shaft at the back of the boiler, to the extremities of which shaft friction discs or couplings are attached. In a line with this shaft are two shafts (one at either end thereof) carrying friction discs or their equivalents for establishing a connection between them and the central driven transverse shaft. These shafts have an endway motion in their bearings, and they carry at



“ their extremities pinions for gearing into rings of teeth on  
“ the hind carrying wheels, or pitch chains, or other suitable  
“ modes of driving may be employed. A tendency is given  
“ by springs or their equivalents for the friction couplings to  
“ keep out of action, but by means of a right and left-handed  
“ screw operated by a worm and worm wheel, the shafts are  
“ pressed inwards when the carrying wheels are required to  
“ be driven, and thus through the friction couplings rotary  
“ motion is communicated from the crank shaft to the pinions  
“ in gear with the carrying wheels. The front or steering  
“ wheel is operated through a segment rack and pinion, or  
“ otherwise, by the attendant, and this motion is so coupled  
“ with the sliding shafts at the rear of the engine as to throw  
“ one or other out of action, according to the direction given  
“ to the steering wheel. By this means one of the driving  
“ wheels will remain quiescent while the other, being driven  
“ as before, will move the engine round, the quiescent wheel  
“ being the fulcrum of the movement. When draft shafts are  
“ fitted to the engine for the purpose of attaching a horse  
“ thereto, the worm and worm wheel actuated by the atten-  
“ dant are dispensed with, the steering being then effected by  
“ the movement of the horse.”

[*Printed, 1s. 10d. Drawings.*]

A.D. 1863, June 13.—No. 1482.

BLACKBURN, ROBERT.—Traction engines.

The Patentee, in describing his invention, says that it is  
“ for improvements upon a former invention for which Letters  
“ Patent were granted to Isaac Blackburn and myself the  
“ 12th February 1857, No. 414. It consists in mounting the  
“ boilers upon flanged wheels, which run upon rails fixed on  
“ the inner surface of the drum, whatever the nature of the  
“ boilers.

“ My invention also consists in placing the boilers parallel  
“ with the length of the drum. Guide wheels are also pro-  
“ vided inside the drum to assist in keeping the boilers in  
“ their proper horizontal line, that is, parallel with the surface  
“ of the road or land on which the drum is travelling. The  
“ engines are supported upon a frame in front of the drum  
“ and between it and the front guide wheels, and the power

“ therefrom is transmitted to the drum. A portion of the  
“ frame extends to the rear of the drum on each side, and the  
“ boilers are also connected to this frame. The outer surface  
“ of the drum may be either plain or corrugated.”

[*Printed, 8d. Drawing.*]

A.D. 1863, August 21.—No. 2082.

LANGE, JEAN BAPTISTE CHARLES.—Distance indicator for vehicles.

The Patentee prefers to construct the apparatus of such size as that when used for common road vehicles it can be placed in the cap of an axle box. “ It is composed of a spindle carrying  
“ a stud or pallet, which strikes against a toothed wheel similar to an ordinary escapement wheel of a clock. A ratchet  
“ lever acted on by a spring keeps this wheel steady, and acts  
“ on it so as to allow only one tooth at a time to pass ; on the  
“ axle of this toothed wheel is a small pinion gearing into a  
“ wheel suitably proportioned and working into similarly  
“ toothed wheels, which give motion to hands or pointers  
“ working on a dial in the same way as those of a clock. In  
“ some cases the inventor employs a third hand or pointer,  
“ which, if preferred, works loosely on the axle, and can be  
“ turned back or put on without derangement of the works ;  
“ this hand is actuated by means of another wheel placed  
“ underneath the toothed wheel first mentioned, and kept  
“ isolated from it by means of a spring round the main axle.  
“ Supposing this apparatus to be fixed in the centre of the  
“ wheel of a carriage, or the main shaft of an engine, the  
“ whole of the machinery would turn round the axle or  
“ spindle before mentioned, and at every revolution the stud  
“ or projection would strike against a tooth of the ratchet  
“ wheel, which would of course communicate the motion in  
“ a greater or less degree to the whole train of wheels, and  
“ consequently the hands.”

[*Printed, 8d. Drawing.*]

A.D. 1863, December 11.—No. 3126.

WEBB, THOMAS.—Traction engines.

The object of this invention is to drive the leading or locking wheels without interfering with their power to rise and

fall independently in passing over rough ground, and for this “ purpose the “nipping” or clip drum used for hauling implements is employed. “The wheels are made to turn “freely on the axle, which is made with a boss or enlargement “in the centre, serving as a bearing for a vertical axis, the “two ends of which are also held in bearings in a forked “piece. The forked piece has a horizontal stem, which is “held and able to turn in a bearing fixed to the engine. By “the turning of the horizontal stem of the forked piece in its “bearing the wheels are allowed to rise and fall independently, “to follow the inequalities of the land travelled over, and the “locking round of the wheels is obtained by the movement “of the axle about the vertical axis. For driving the wheels “a small nipping drum is mounted on the vertical axis before- “mentioned, and this is driven by an endless rope passing “around it and also around the main nipping drum. On the “same axis two bevelled wheels are also mounted, the one “under and the other over the axle, and they gear with other “similar bevelled wheels fixed on tubes which are able to “turn freely on the axle, and these tubes at their outer ends “are capable of being clutched with the wheels. Thus when “the main nipping drum is driven it rotates the two leading “wheels without interfering with their locking motion, and “when required for rapid turning one or other of the two “wheels may be thrown out of gear. When the engine is “required for hauling, the endless rope is removed from the “main nipping drum. In place of using the main nipping “drum for driving the fore wheels an extra nipping drum “may be employed for the purpose, or for the small nipping “drums chain wheels or other gear may be substituted.

“A similar arrangement may be employed in traction and “other engines. If desired, the hinder wheels as well as the “leading wheels may be arranged to lock and rise and fall “independently of the engine, as above described, and the “power may then be communicated to the hinder or main “driving wheels in a similar manner.”

[*Printed, 1s. Drawings.*]

A.D. 1863, December 18.—No. 3196.

SAUNDERS, ROBERT.—Panels.

The invention chiefly relates to the construction of portable

houses, for which purposes panels made as herein-after mentioned are used. These panels, which are also claimed to be useful for the construction of carriages, are made "of two sheets of iron joined together by overlapping the edge of one sheet with the edge of the other sheet, taking care to keep them some distance apart," and filling the intervening space with "cocoa-nut waste" or other non-conducting material. The panels may have one "hollow or grooved edge so as to overlap the edge of the panel next below it."

[*Printed, 10d. Drawing.*]

A.D. 1863, December 24.—No. 3260.

MARSDEN, WILLIAM, and STUBBS, FRANCIS HENRY.—(*Provisional protection only.*)—Increasing adhesion of the wheels of locomotive engines for rail or common roads.

"These improvements consist in applying to a locomotive engine a lever or levers, to which may be applied portable and adjustable weight or weights, the fulcrum being in any convenient part of the framing thereof. The weight employed may be the tender, or a portable weight or weights carried thereby, or water from the tank may be employed, or a spring or springs attached to the tender may be applied to the said lever or levers. The said weight or weights may be brought into action on the said lever or levers by other levers and connecting rods and screws or segment wheel and worm shaft so applied and arranged as to be actuated by a hand wheel. By these means or appliances additional weight may be placed on the engine, consequently producing greater adhesion of the wheels to the rails or road, or increased tractive power to such engines.

[*Printed, 4d. No Drawings.*]

A.D. 1864, January 15.—No. 114.

HOWARD, JAMES, BOUSFIELD, EDWARD TENNEY, and PINNEY, JOHN.—Steering traction engines.

This invention relates chiefly to machinery for hauling ploughs and other agricultural implements. It also comprises means of steering the portable engines used for the above purpose. It is proposed "to place the front or steering wheels of the engine within the frame, and to operate them by means

“ of a segment rack which is connected to the axle of these  
 “ wheels. The attendant works the segment rack from his  
 “ seat by means of a spur pinion on a hand-wheel shaft. On  
 “ this spur pinion is cast a bevil pinion, which gears into and  
 “ drives a second segment rack, which conveys through a  
 “ rock shaft, which carries it, a sideway motion to the friction  
 “ coupling of the driving wheels. In the act therefore of  
 “ steering the front wheels one or other of the hind wheels  
 “ will be thrown out of gear and form a fulcrum for the  
 “ engine to turn on. To the axle of the fore-wheels shafts  
 “ may be fitted to receive a horse. In this case the attendant  
 “ will steer the engine by guiding the horse, the steering  
 “ mechanism transmitting the requisite motion to the friction  
 “ coupling as before.”

[*Printed, 2s. Drawings.*]

A.D. 1864, May 31.—No. 1351.

FOWLER, JOHN, and WEBB, THOMAS.—“ Steam carriages to  
 “ travel on common roads,” &c.

These improvements “are particularly applicable to light  
 “ steam carriages suitable for carrying passengers.”

This invention may be divided into two parts:—Firstly,  
 means of heating the boiler by gas carried in a reservoir in a  
 compressed state or by petroleum oil. The gas is burned in  
 burner tubes in the boiler tubes, or it may be burned in the  
 fire box. The oil is thrown into the heated ends of the burner  
 tubes, and there converted into gas which is burned in the  
 tubes, or it may be injected into the fire box in the form of  
 spray.

Secondly, condensing the steam by means of the feed water;  
 and to keep the latter sufficiently cool air is drawn through it  
 to feed the fire, or is driven through it by a fan.

[*Printed, 1s. 4d. Drawings.*]

A.D. 1864, June 29.—No. 1626.

CLARK, WILLIAM—(*A communication from Aristide Paul  
 Blanchet.*)—(*Provisional protection only.*)—Traction engine.

This engine is intended for hauling cultivators, but it is also  
 a traction engine.

It is supported on four wheels. The two leading wheels

are mounted upon an axle connected with a sector moveable to right or left by a chain and pulleys worked by hand so as to steer the engine. The driving wheels are mounted on an axle and may be thrown in and out of gear. At the back of the engine is a rope drum also driven from the crank shaft by clutch gear. Clearers fixed to the arms of the steering apparatus are placed in front of the fore wheels "for removing any unevenness which might cause an obstacle to the motion of the locomotive." The remainder of this invention does not relate to this series.

[*Printed, 1s. 8d. Drawings.*]

A.D. 1864, September 7.—No. 2184.

WARD, WILLIAM HENRY. — (*Provisional protection only.*) — Tramways and carriages.

The carriage has a central passage, and the seats have reversible backs. It is supported on trucks or bogies by means of ringbolts to allow of lateral swinging in passing curves. The trucks or bogies are connected by gear so that the motion of one is communicated to the other. The draught is attached to a "cross bar evener, which has parallel connecting rods with the trucks, which may extend crosswise from truck to truck." The draught may be detached by a hand rod secured to the pole or tongue. Brakes are applied by a hand wheel secured to a ratchet wheel shaft. Cleaners or scrapers are fitted to clear the rails. The carriage has a door at each end, and there are bells for communication.

[*Printed, 4d. No Drawings.*]

A.D. 1864, November 24.—No. 2931.

MOLYNEUX, ECHLIN, junior. — (*Provisional protection only.*) — Travelling railways.

This invention relates to improvements upon an invention protected by Letters Patent, dated 15th October 1862, No. 2776. It is thus described by the inventor:—"Each wheel of the carriage to which the travelling railway is to be attached is cast in two separate segments, which are keyed on the axle in their proper relative positions. Each segment resembles an ordinary railway carriage wheel with this important difference, that only one half of its periphery is a true semi-

“ circle concentric with the axle which passes through it, and  
 “ the extremities of this semicircle are rounded off with circular arcs struck with a smaller radius. These segments  
 “ are keyed on the axle at opposite sides, and in parallel  
 “ planes, the parallel planes being the vertical planes containing the rails on which the wheel runs. These segments  
 “ forming one wheel are keyed on the axle at a distance  
 “ apart equal to half the difference of the guages of the two  
 “ lines of rails hereafter described. The segments (that is to  
 “ say, the segments of opposite wheels on the same axle),  
 “ arranged to run on any one line of rails, are keyed on the  
 “ same side of the axle at a distance apart equal to the guage of  
 “ that line. Side flanges are cast on to the rims of the wheels  
 “ to prevent them from running off the rails. The wheels of  
 “ each carriage may be two, four, or six in number; but  
 “ where more than two are employed running on the same  
 “ rails, they must be coupled so as to retain them in their  
 “ proper relative positions with regard to the rails. I employ  
 “ two lines of rails of different guages, which are arranged to  
 “ run one within the other, and I make the length of each  
 “ line not less than the semi-circumference of the carriage  
 “ wheels, and usually once and a half to double that length.  
 “ The guage of each line is preserved by transverse tie bars.  
 “ Each line of rails is attached by chains to a truck which  
 “ runs freely on rails (which I shall call truck rails to distinguish them from those on which the carriage runs)  
 “ attached to the carriage parallel with its longitudinal axis,  
 “ and equal in length to the carriage rails. When the carriage is bearing on one line of rails, the other line is being  
 “ moved forward; and in order to enable it to clear any  
 “ obstacle which may lie in its path, and to reduce the friction to a minimum, it is raised from the ground to any  
 “ convenient height the carriage wheels will admit of by  
 “ (1), springs; (2), weighted levers; or (3), cams worked by  
 “ the revolution of the carriage wheels attached to the trucks;  
 “ and so hanging suspended therefrom, it is moved forward  
 “ by appropriate mechanism.”

The rails may be suspended by springs, or by chains worked by weighted levers or by cams. The forward movement of the rails may be effected by springs or by gravitation, which power is rendered available by laying the truck rails on a

sloping gradient, or by mechanism worked by the revolution of the axle.

[*Printed, 4d. No Drawings.*]

A.D. 1864, December 17.—No. 3137.

EASTMAN, ZEBINA.—Tramways and carriages.

The tram consists of concave rails, or one concave and one flat rail. The wheels are convex to fit loosely the concave rails and flat to run on the flat rail. Each pair of wheels is mounted on a pivotted axle, which is connected with the axle of the next pair by bars or geared segments. Thus the motion of one pair in passing a curve is communicated to the rest.

[*Printed, 10d. Drawing.*]

A.D. 1864, December 28.—No. 3223.

BLANCHET, ARISTIDE PAUL.—(*Provisional protection only.*)  
—Traction engine for agricultural implements.

The only part of this invention relating to the present series is the steering arrangement. The engine is supported by a pair of large hind wheels and a pair of smaller fore wheels. As the fore wheels “only support the framing of the machine  
“ at one point in the middle, they may pivot to the right or  
“ left, and by this means take the desired direction. To give  
“ this direction the two extremities of the axle of the small  
“ wheels have attached to them the two arms of a steering  
“ apparatus, which is manœuvred by the aid of a winch  
“ within reach of the engineer.”

[*Printed, 4d. No Drawings.*]

A.D. 1865, January 11.—No. 91.

BATHIAS, CLAUDE MARIE.—(*Provisional protection only.*)—  
“ Apparatus for registering the distance travelled by  
“ vehicles,” &c.

The measurement is effected by causing the number of revolutions of a wheel to be indicated by a series of polygonal discs. Each disc has a number on each side of the polygon, and they are rotated by a shaft set in motion by a pawl on the wheel axle. The number of rotations made by the wheel in a given distance is previously ascertained. These may be added to the indicator apparatus for effecting a total of the



day's travel, and apparatus by which the passenger can restore the instrument to zero.

[*Printed, 6d. Drawing.*]

A.D. 1865, April 11.—No. 1022.

MYERS, JAMES JOHN.—(*Provisional protection only.*)—Wheels for tramroads.

To facilitate passage of curves and prevent grinding one of each pair of wheels has a loose tire. The tire is held on the wheel by a flange running in a groove in the wheel and properly lubricated.

[*Printed, 4d. No Drawings.*]

A.D. 1865, October 23.—No. 2736.

JULIEN, MATHIEU, senior. — (*Provisional protection only.*)—Distance indicators for vehicles.

For the purpose of communicating the movement of the axle, or the cam thereon, to the registering instrument, the inventor causes the former to act upon a piston or membrane at one end of a tube filled with water. The registering index is in communication with a similar piston or membrane at the other end, which is put in motion by the wave of pressure transmitted through the water.

[*Printed, 4d. No Drawings.*]

A.D. 1866, January 9.—No. 67.

MACRUM, JAMES MARIUS. — (*A communication from John Davis.*)—Brake for tramway cars.

This brake is put on by springs or weighted levers. In its normal condition it is always in application, but by means of the tension of the draw bar it is held off. A hand wheel is added to the apparatus by which it may be retained in its "on" or "off" position. When the direction of the vehicle is reversed the body may be turned on its framing, or the brakes may be worked from a similar draw bar at the other end.

[*Printed, 1s. 6d. Drawings.*]

A.D. 1866, January 18.—No. 168.

SPENCER, GEORGE.—India-rubber springs.

The cylindrical or other shaped mass of india-rubber is surrounded by rings of metal with the addition of "cup spaces"

or "cup plates" to receive the rubber when in compression, the object of the invention being "to increase the power of " the first part of the stroke which " the inventor finds " unnecessarily limited in the conical form of spring " previously used by him. He also uses metal wires embedded in such elastic cylinders. He also claims " the combination of " confining rings, such as are known as Coleman's, and " patented by him on the 28th June 1852, No. 14,193, with " metal wires embedded in cylinders of india-rubber to in- " crease their existing power, as patented by S. Moulton on " the 10th January 1861, No. 62."

The improved springs may be used as bearing springs " between the under frame of carriages and the body of " carriages, as patented by George Attock, on the 31st August " 1863, No. 2145."

[Printed, 10d. *Drawing.*]

A.D. 1866, September 12.—No. 2340.

GEDGE, WILLIAM EDWARD.—(*A communication from Etienne Théophile Prioux.*)—Indicator for carriages.

Every revolution of the wheel compresses a pneumatic apparatus or bellows. The wave of compressed air, communicated through an elastic tube, puts in motion a similar apparatus at the indicator. A clockwork movement causes a registering cylinder to make one revolution every hour, and a sheet of paper rolled round the cylinder receives a dot or puncture every hundred yards of progression of the vehicle. When the latter is at rest the paper remains blank and thus gives the time during which the vehicle has not been in motion. Apparatus connected with the carriage seat shows how long the latter has been occupied.

[Printed, 10d. *Drawings.*]

A.D. 1866, November 13.—No. 2971.

BROOMAN, CLINTON EDGCUMBE. — (*A communication from Urbain André Chauveau, and Henri Marie Joseph le Nepoon de Carfort.*)—Road engine for towing, &c.

Each driving wheel is independent of the other of the pair and is driven by a chain from the crank shaft. By this means the engine may be steered. Two bearing wheels support the rear of the framing. The front is carried by a pivot near the

driving shaft, behind the axis of the driving wheels. Thus the motion is less sudden when a change of direction is made. "When it is placed behind the driving wheels it is necessary to employ a small wheel pivotted to a bracket behind the driving wheels and following their movement, so that the equilibrium of the apparatus may be maintained."

[*Printed, 4d. No Drawings.*]

A.D. 1866, November 14.—No. 2979.

BATHIAS, CLAUDE MARIE.—"Apparatus for registering the speed of machinery or distance travelled by vehicles."

This apparatus, which may be modified in various ways by combination of numerating discs, so as to sum up totals and so forth, is thus described by the Patentee:—It "consists in the combination of three discs without springs, the working of which enables one to ascertain in an indefinite manner by augmenting the discs by series of three the rotary or rectilinear motion of all sorts of machines or vehicles. The first disc, cut in the form of a Maltese cross, has ten concave sides, on which are inscribed the numbering figures; the second carries ten teeth which catch into the preceding; and the third carries a single tooth on its circumference, the radius of which is equal to that of the concavity of the sides of the first disc. The second and third discs are solidly joined together, their thickness is the same as that of the first disc. The first disc is shipped on to an axle and the two others on to another axle at a convenient distance, so as to allow the first disc to catch in with the two other discs; disc No. 1 in one revolution bears along at the same time disc No. 2, and consequently disc No. 3 which is connected to it; but when disc No. 1 has checked off the ten numbering figures it carries disc No. 3, which has but one tooth, has only travelled round  $\frac{1}{10}$  or a single figure of disc No. 1 of the second series of three discs, and so on. The application of this combination to a vehicle takes place by means of discs bearing ratchets or unequal sides so calculated that the sum of their revolutions correspond with that of the wheels of the vehicle, the circumference of which has been previously measured."

[*Printed, 8d. Drawing.*]



## INDEX OF SUBJECT MATTER.

[The numbers refer to the pages on which the Abridgments commence.  
The names printed in *Italic* are those of the persons by whom the  
Inventions have been communicated to the Applicants for Letters Patent.]

### Adhesion increasing. *See also*

#### Wheels :

Marsden and Stubbs, 1214  
(*Supp.*)

### Advertising, vehicles for :

Harris, 195.  
Duncan, 410.

### Ambulances. *See* Invalid car- riages, &c. :

### Ammunition waggons :

Francis, 555.

### Aprons :

Randolph, 121.  
Hunt, 622.  
Durant and Gore, 1019.  
Russell, 1124.

### Arm rests :

Cottam, 739.  
Lewis, 948.

### Attaching or putting horses to carriages, arrangements of shafts, &c. for :

Earl, 783.  
Bonneville (*Beguin*), 983.

### Axle-boxes :

Hancock, 7.  
King, 11.  
Pease and Monk, 15.  
O'Keefe, 20.  
James and Mason 26.  
Jacob, 29.  
Willey, 30  
Jacob, 31.  
Taylor, 35.  
Somerton, 37  
Newcome, 38.  
Jordan and Swinton. 39.  
Jacob, 40.  
Lydford, 47.  
Berriman, 48.  
Shankster, 49.  
Besant, 51.

### Axle-boxes—*cont.*

Collinge, 57.  
Collinge, 70.  
Willey, 72.  
Vaughan, 76.  
Lockett, 87.  
Bauer, 97.  
Jacob, 100.  
Rowntree, 102.  
Cabanel, 112.  
Paton, 117.  
Flight, 119.  
Varty, 126.  
Wheatley, 127  
Collinge, 128.  
Taylor, 131.  
Bellingham, 138.  
Kittoe, 141.  
Whitfield, 148.  
Hardy, 163.  
Matthews, 171.  
Smith, 176.  
Millichap, 178.  
Marsh, 179.  
Stafford, 197.  
Mason, 201.  
Mason, 214.  
Burgess, 215.  
Slater, 224.  
Pearse, 239.  
Mason, 240.  
Pearse, 247.  
Reedhead, 257.  
Collinge, 259.  
Hynes, 272.  
Adams, 274.  
Mason, 279.  
Hurlock, 286.  
Hayman, 295.  
Poole, 312.  
Poole, 316.  
Prior, 318.  
Adams and Buchanan, 322.  
Adams, 336.  
De Bergue, 344.  
Pape, 349.  
Gibson, 351.  
Newton, 364.  
Wolferstan, 365.  
Walker, 366.  
Newton, 369.  
Rowan, 372.

Axle-boxes—*cont.*

Parby, 373.  
 Poole, 381.  
 Mallet and Dawson, 397.  
 Horne, Beadon, and Smith,  
 416.  
 De Strubing, 439.  
 Bunnett, 449.  
 Hodge, 458.  
 Newton, 465.  
 Harcourt and Harcourt,  
 476.  
 Goodman, 480.  
 Chinnock, 489.  
 Green, 494.  
 Reading, 499.  
 Maude, 505.  
 Davis, 508.  
 Newton, 517.  
 Wilson, 533.  
 Gilbee, 541.  
 Bellford, 542.  
 De Fontainemoreau, 546.  
 Jean and Hugues, 548.  
 Durant, 552.  
 Johnson (*Laurent*), 554.  
 Edwards and Frasi, 561.  
 Adams, 566.  
 Durant, 572.  
 Avisse, 574.  
 Black, 574.  
 Heyns, 630.  
 Wallace, 635.  
 Holden, 639.  
 Emery, 641.  
 Cresswell, 664.  
 Fellows, 664.  
 Bousfield, 666.  
 Brussant, 690.  
 Chaufour, 701.  
 Johnson (*Wendell and Wen-*  
*dell*), 702.  
 Heyns, 708.  
 Beattie, 709.  
 Croker, 715.  
 Steven, 722.  
 Booth, 722.  
 Luis, 727.  
 Hadley, 732.  
 Partridge, 757.  
 Lyall and Campin, 759.  
 Davis, 764.  
 Gradwell and Gradwell, 772.  
 Delannoy, 775.  
 Juzet, 786.  
 Brown, 797.  
 Partridge, 801.  
 Clark (*Deming*), 802.  
 Partridge, 812.  
 Menmons (*Cambon*), 815.  
 Prentiss, 1201 (*Supp.*)  
 Brooman (*Bertrand*), 832.  
 Rickards (*De Mat*), 838.  
 Johnson (*Gallegos*), 842.  
 Delannoy, 853.  
 Watkins, 856.

Axle-boxes—*cont.*

Duley, 879.  
 Clarke, 901.  
 Uphill, Morton, and Asbury,  
 927.  
 Chinnock, 932.  
 Muntz, 950.  
 Roberts (*Cramer*), 953.  
 Asbury, 979.  
 Bailly (*Durand*), 982.  
 Adams, 1001.  
 Rodgers, 1009.  
 Brooman (*Frainet*), 1023.  
 Etienne, 1030.  
 Day (*Lischine and Handy-*  
*side*), 1036.  
 Swift, 1041.  
 Glover, 1044.  
 Skeldon, 1045.  
 Richards, 1046.  
 Rice, 1055.  
 Partridge, 1064.  
 Wright, 1097.  
 Bonneville (*Chollet*), 1106.  
 Sovereign, 1124.  
 Edwards, 1149.  
 Richards and Grindle, 1167.

Axle-boxes from wheels, appa-  
ratus for removing :

Drabble, 1110.

Axles and axletrees (all in-  
ventions relating to) :

Knappe, 1.  
 Hill, 3.  
 Rowe, 11.  
 Tull, 12.  
 Ladd, 14.  
 Pease and Monk, 18.  
 O'Keefe, 20.  
 Wildey, 30.  
 Matthews, 41.  
 Edgell, 48.  
 Shankster, 49.  
 Moore, 49.  
 Besant, 51.  
 Garnett, 52.  
 Gottlieb, 53.  
 George, 55.  
 Hatchett, 58.  
 Ducrest, 60.  
 Sharples, 66.  
 March, 68.  
 Collinge, 70.  
 De Lolme, 73.  
 Vaughan, 76.  
 Edgell, 76.  
 Godfrey, 78.  
 Halladay, 81.  
 Turner, 86.  
 Koster, 92.  
 Trevithick and Vivian, 96.  
 Bauer, 97.  
 Tate, 98.

Axles and axle-trees, &c.—  
*cont.*

Brown, 101.  
 Rowntree, 102.  
 Cooke, 107.  
 Lloyd, 110.  
 Cabanel, 112.  
 Dumbell, 116.  
 Randolph, 121.  
 Varty, 126.  
 Wheatley, 127.  
 Collinge, 128.  
 Brown, 133.  
 Bellingham, 138.  
 Bramah, 139.  
 Kittoe, 141.  
 Whitfield, 148.  
 Gompertz, 150.  
 Banks, 160.  
 Burnett, 161.  
 Panter, 164.  
 Champness and Binks, 165.  
 Ackerman (*Lenkensperger*), 168.  
 Smith, 175.  
 Millichap, 178.  
 Main, 178.  
 Gordon, 183.  
 Whitcher, Pickford, and  
 Whitbourn, 187.  
 Bewley, 191.  
 Isaacs, 192.  
 Gunn, 193.  
 Burstall and Hill, 198.  
 Mason, 201.  
 Brandreth, 206.  
 Pope, 207.  
 Stephenson, 208.  
 Mason, 214.  
 Burges, 215.  
 Spong, 217.  
 Gurney, 218.  
 Slater, 224.  
 Winans, 227.  
 Knowles, 229.  
 Sculthorpe, 229.  
 Pearse, 239.  
 Mason, 240.  
 Hanson, 241.  
 Pearse, 247.  
 Mason, 249.  
 Church, 250.  
 Reedhead, 257.  
 Hynes, 272.  
 Church, 275.  
 Hardy, 276.  
 Ingledew, 276.  
 Carpmael, 279.  
 Hurlock, 286.  
 Adams, 288.  
 Braby, 293.  
 Ball, 303.  
 Hardy, 303.  
 Darthez, 308.  
 Dugdale (*Riend*), 311.  
 Gillott and Walker, 315.  
 Poole, 316.

Axles and axle-trees, &c.—  
*cont.*

Prior, 318.  
 Adams and Buchanan, 322.  
 Dodds and Owen, 324.  
 Greenway, 328.  
 Hills, 331.  
 Adams, 336.  
 De Bergue, 344.  
 Bouveiron, 347.  
 Gibson, 351.  
 Lee, 353.  
 James, 357.  
 Ralli, 362.  
 Newton, 364.  
 Wolferstan, 365.  
 Waler, 366.  
 Hills, 367.  
 Briggs, 371.  
 Rowan, 372.  
 Rouse, 375.  
 Hill, 380.  
 Moor, 380.  
 Poole, 381.  
 Millichap, 382.  
 Aitken, 398.  
 Miller, 429.  
 Schiele, 432.  
 Brandt, 434.  
 Bertrand, 436.  
 Cowper, 438.  
 Hurry, 442.  
 Newton, 443.  
 Onions, 455.  
 Pidding, 460.  
 Newton, 465.  
 Davis, 469.  
 Goodman, 480.  
 Payne, 482.  
 Newton, 484.  
 Gordon, 484.  
 Lord, 484.  
 Fontainemoreau, 485.  
 Lovely, 486.  
 Arrowsmith, 488.  
 Dodds, 492.  
 Eades, 503.  
 Maude, 505.  
 Lenz, 506.  
 Payne, 507.  
 Roosevelt, 507.  
 Solomon and Mills, 507.  
 Davis, 508.  
 Ward, 518.  
 De Montferrier, 523.  
 Pomme, 528.  
 Brown, D. & J., 532.  
 Gilbee, 541.  
 Bellford, 542.  
 De Fontainemoreau, 546.  
 Stocker, 546.  
 Dalgety, 547.  
 Jean and Hugues, 548.  
 Gerner, 549.  
 Durant, 552.  
 Johnson (*Laurent*), 554.  
 Townsend, 564.

# Axles and axle-trees, &c.— *cont.*

Scott, 571.  
 Durant, 572.  
 Black, 574.  
 Newman and Whittle, 583.  
 Johnson (*Roy*), 584.  
 Wren, 584.  
 Scott, 588.  
 Brécheux, 599.  
 Swift, 604.  
 Rock, 619.  
 Roberts, 620.  
 Scott, 626.  
 Heyns, 630.  
 Wallace, 635.  
 Emery, 641.  
 Maberly, 646.  
 Dumarchey, Levy, and Mayer,  
 647.  
 Fellows, 664.  
 Fowler, Burton, and Clarke,  
 666.  
 Murdoch, 667.  
 Brussant, 690.  
 Johnson (*Wendell and  
 Wendell*), 702.  
 Beattie, 709.  
 Scotson and Charnley, 721.  
 Booth, 722.  
 Hadley, 732.  
 Lowe, Trueman, and Pitts,  
 746.  
 Barrans, 749.  
 Aimont, 755.  
 Gilbee (*Tenting*), 756.  
 Brooman (*Masson*), 763.  
 Davis, 764.  
 Luis (*Gangand*), 772.  
 Gradwell and Gradwell, 772.  
 Mallett, 780.  
 Tenting, 783.  
 Stirling, 790.  
 Wilson and North, 791.  
 Brown, 797.  
 Partridge, 801.  
 Train, 803.  
 Partridge, 812.  
 Samuel and Train, 815.  
 Mennons, (*Cambon*), 815.  
 Brooman (*Bertrand*), 832.  
 Rickards (*De Mat*), 838.  
 Richardson, 852.  
 Watkins, 856.  
 Lee and Taplin, 864.  
 Hawksley, 876.  
 Lee and Taplin, 878.  
 Marshall, 881.  
 Bray, 888.  
 Selby, 890.  
 Gladstone, 900.  
 Clarke, 901.  
 Johnson (*Bathias*), 904.  
 Thirion, 912.  
 Death, 917.  
 Wessely, 921.

# Axles and axle-trees, &c.— *cont.*

Upfill, Morton, and Asbury,  
 927.  
 Chinnock, 932.  
 Muntz, 950.  
 Abel (*Andeneau*), 952.  
 Gorst, 956.  
 Barclay, 958.  
 Burden, 961.  
 Asbury, 979.  
 Roberts, 982.  
 Bailly (*Durand*), 982.  
 Adams, 1001.  
 Cope, 1018.  
 Swift, 1041.  
 Skeldon, 1045.  
 Richards, 1046.  
 Craven and Fox, 1053.  
 Adams, 1059.  
 Clark (*Duméry*), 1048.  
 Gedge (*Legault*), 1054.  
 Bailly, Durand, Mesnard,  
 and Poirier, 1061.  
 Partridge, 1064.  
 Wright, 1097.  
 Lones, Lones, Brettell, Bret-  
 tell, and Vernon, 1128.  
 Scott, 1133.  
 Edwards, 1149.  
 Davies (*Singer*), 1149.  
 Holliss, 1159.  
 Richards and Grindle, 1167.  
 Gore, 1171.

# Axles and axletrees (varieties of, arrangements relating to, &c.):

Antifricition;  
 Rowe, 11.  
 Ladd, 14.  
 Garnett, 52.  
 Gottlieb, 53.  
 George, 55.  
 Sharples, 66.  
 Edgell, 76.  
 Godfrey, 78.  
 Halladay, 81.  
 Tate, 98.  
 Brown, 101.  
 Lloyd, 110.  
 Panter, 164.  
 Champness and Binks, 165.  
 Millichap, 178.  
 Burges, 215.  
 Spong, 217.  
 Winans, 227.  
 Reedhead, 257.  
 Church, 275.  
 Ball, 303.  
 Darthez, 308.  
 Poole, 316.  
 Greenway, 328.  
 Bouveiron, 347.  
 James, 357.



Axles and axletrees (varieties of, arrangements relating to, &c.)—*cont.*

Antifriction—*cont.*

Newton, 364.  
Rowan, 372.  
Brandt, 434.  
Fontainemoreau, 486.  
Lenz, 506.  
Roosevelt, 507.  
Solomon and Mills, 507.  
De Montferrier, 523.  
Pomme, 528.  
Gilbee, 541.  
Dalgety, 547.  
Jean and Hugues, 548.  
Gerner, 549.  
Brussant, 690.  
Booth, 722.  
Gradwell and Gradwell, 772.  
Mennons (*Cambon*), 815.  
Chinnock, 932.  
Bailly (*Durand*), 982.  
Cope, 1018.  
Skeldon, 1045.  
Bailly, Durand, Mesnard, and Poirier, 1061.

Connecting;

Knowles, 229. ✓  
James, 357. ✓  
Gordon, 484. ✓  
Eades, 503. ✓  
Maude, 505. ✓  
Davies (*Singer*), 1149. ✓

Cooling by air, &c.;

Halladay, 81.

Covering;

Richardson, 852.

Cranked;

Wilson and North, 791.

Guards for;

Beattie, 709.

Hinged;

Cooke, 107.

Lubricating axles;

Knappe, 1.  
Hancock, 7.  
O'Keefe, 20.  
James and Mason, 26.  
Willey, 30.  
Jordan and Swinton, 39.  
Berriman, 48.  
Gottlieb, 53.  
Collinge, 57.  
Norton, 62.  
March, 68.  
Collinge, 70.  
Willey, 72.  
Halladay, 81.  
Koster, 92.  
Bauer, 97.  
Tate, 98.  
Cabanel, 112.  
Paton, 117.  
Flight, 119.

Axles and axletrees (varieties of, arrangements relating to, &c.)—*cont.*

Lubricating axles—*cont.*

Varty, 126.  
Wheatley, 127.  
Collinge, 128.  
Taylor, 131.  
Brown, 133.  
Bellingham, 138.  
Bramah, 139.  
Spratley, 145.  
Whitfield, 148.  
Stead, 159.  
Burnett, 161.  
Koster, 166.  
Smith, 175.  
Millichap, 178.  
Bewley, 191.  
Gunn, 193.  
Mason, 201.  
Mason, 214.  
Spong, 217.  
Slater, 224.  
Winans, 227.  
Pearse, 239.  
Mason, 240.  
Pearse, 247.  
Mason, 249.  
Redmund, 261.  
Quaintin, 262.  
Hynes, 272.  
Adams, 274.  
Mason, 279.  
Adams and Buchanan, 322.  
Hills, 331.  
Wright, 340.  
De Bergue, 344.  
Bouveiron, 347.  
Pape, 349.  
Gibson, 351.  
Lee, 353.  
Newton, 364.  
Wolferstan, 365.  
Walker, 366.  
Newton, 369.  
Parlby, 373.  
Poole, 381.  
Mallet and Dawson, 397.  
Aitken, 398.  
Exall, 403.  
Carter, 409.  
Hurry, 442.  
Bunnett, 449.  
Dixon and Dodson, 462.  
Newton, 465.  
Davis, 469.  
Newton, 484.  
Lovely, 486.  
Chinnock, 489.  
Green, 494.  
Warcup, 503.  
Maude, 505.  
Davis, 508.  
Newton, 517.  
Bellford, 542.  
De Fontainemoreau, 546.

**Axles and axletrees (varieties of, arrangements relating to, &c.)—cont.**

**Lubricating axles—cont.**

Durant, 552.  
 Johnson (*Laurent*), 554.  
 Edwards and Frasi, 561.  
 Adams, 566.  
 Durant, 572.  
 Avisse, 574.  
 Black, 574.  
 Garratt, 575.  
 Scott, 588.  
 Roberts, 620.  
 Hardacre, 623.  
 Cresswell, 664.  
 Munro, 678.  
 Chaufour, 701.  
 Johnson (*Wendell and Wendell*), 702.  
 Clark, 704.  
 Heyns, 708.  
 Beattie, 709.  
 Croker, 715.  
 Hadley, 732.  
 Braby and Braby, 737.  
 Davis, 764.  
 Russell, 768.  
 Watkins and Pugh, 771.  
 Luis (*Gangand*), 772.  
 Delaunoy, 775.  
 Mallett, 780.  
 Juzet, 786.  
 Brown, 797.  
 Clark (*Deming*), 802.  
 De Buyer, 805.  
 Taylor, 809.  
 Partridge, 812.  
 Johnson (*Gallejos*), 842.  
 Delannoy, 853.  
 Watkins, 856.  
 Partridge, 863.  
 Adams, 1205 (*Supp.*)  
 Tyson, 876.  
 Amies, 924.  
 McClintock, 942.  
 Roberts (*Cramer*), 953.  
 Asbury, 979.  
 Adams, 1001.  
 Etienne, 1030.  
 Day (*Lischine and Handy-side*), 1036.  
 Swift, 1041.  
 Glover, 1044.  
 Richards, 1046.  
 Sievier, 1046.  
 Gedge (*Legault*), 1054.  
 Rice, 1055.  
 Wright, 1097.  
 Bonneville (*Chollet*), 1106.  
 Sovereign, 1124.

**Radial;**

Winans, 227.  
 Payne, 507.  
 Aimont, 755.  
 Stirling, 790.

**Axles and axletrees (varieties of, arrangements relating to, &c.)—cont.**

**Radial—cont.**

Adams, 1205 (*Supp.*)  
 Adams, 1001.  
 Craven and Fox, 1053.  
 Adams, 1059.

**Shifting;**

Knappe, 1.  
 Lee and Taplin, 864.  
 Marshall, 881.

**Baggage, securing to carriages :**

Martin, 36.  
 March, 68.  
 Pratt, 188.  
 Ranking, 191.  
 Gunn, 193.  
 Brown, 232.  
 Blackwell, 493.

**Barrows. See Wheelbarrows.**

**Bath chairs. See Invalid carriages, &c.**

**Bearings :**

Bramah, 139.  
 Kittoe, 141.  
 Burnett, 161.  
 Champness and Binks, 165.  
 Koster, 166.  
 Ackermann (*Lenkensperger*), 168.  
 Bewley, 191.  
 Fuller, 216.  
 Josephs, 225.  
 Winans, 227.  
 Knowles, 229.  
 Ingleden, 276.  
 Hills, 331.  
 Bouveiron, 347.  
 Briggs, 371.  
 Vingoe, H. and W. H., 373.  
 Mallet and Dawson, 397.  
 De Strubing, 439.  
 Bunnett, 449.  
 Edwards and Frasi, 561.  
 Emery, 641.  
 Beattie, 709.  
 Brooman (*Masson*), 763.  
 Devlan, 842.  
 Delannoy, 853.  
 Death, 917.  
 Amies, 924.  
 Devlan, 937.  
 Burton, 953.  
 Gidlow, 989.  
 Clark (*Duméry*), 1048.  
 Markham (*McIvor*), 1074.  
 Osborne, 1145.  
 De Gablenz, 1147.

Bicycles. *See* Velocipedes.

Blinds :

Laycock, 26.  
Moore, 46.  
Roberts, 148.  
Gillett and Chapman, 291.  
Prior, 318.  
Statham, 360.  
Mellish, 454.  
Holdway, 603.  
Jenner, 1006.  
Startin, 1078.  
Scott, 1133.  
Morgan and Morgan, 1182.

Boats, vehicles which may be used as :

Reddell, 89.  
Francis, 555.  
Gerard, 570.  
Francis and Manby, 693.  
Lungley, 717.  
Symes, 1017.  
Steevens, 1035.

Bodies of vehicles. *See also*,  
Doors ; Framing, &c. ;  
Heads, hoods, and roofs ;  
Panels ; Paper, &c.

Adjusting centre of gravity of ;  
Koster, 166.  
Banks, 168.  
Main, 178.  
Pearse, 247.  
William, 311.  
Tomlinson, 1024.

Cylindrical ;  
Brennand, 761.  
Brooman (*De Maklakoff*),  
903.

Rolling and sliding on framing ;  
Ralli, 362.  
Powell, 390.  
Hadley, 732.  
Steevens, 1035.

Bodies of vehicles, hanging.  
*See* Vehicles, suspending ;  
Springs.

Bogies :

Train (*Grice and Long*),  
825.

Boilers of steam carriages, ad-  
justment of :

Reynolds, 157.  
Bustall and Hill, 210.  
Church, 275.  
Anderson, 679.  
Anderson, 714.  
Smith, 727.  
Burrell, 742.

Boilers of steam carriages,  
adjustment of—*cont.*

Savage, 762.  
Longstaff and Pullan, 771.  
Travis, 816.  
Daxley, 1202 (*Supp.*)  
Chellingworth and Thur-  
low, 835.  
Lee and Taplin, 864.  
Simonton, 867.  
Chellingworth and Thur-  
low, 868.  
Lee and Taplin, 878.  
Pullan and Lake, 889.  
Lee, 1207 (*Supp.*)  
Lee, 913.  
Death, 917.  
Law and Downie, 950.  
Morel, 970.  
Cope, 1018.  
Adams, 1059.  
Bischoff, 1141.

Boots. *See also* Boxes, lockers,  
&c. :

Gunn, 193.  
Brown, 232.  
Palliser, 394.  
White, 776.

Boxes, driving :

Tull, 12.  
Jacob, 33.  
Abery, 44.  
Moore, 46.  
Davis, 55.  
Shankster, 56.  
March, 68.  
Reddell, 90.  
Newman, 181.  
Gillett and Chapman, 291.  
Weston, 294.  
Palliser, 394.  
Newton, 478.  
Bird, 499.  
Newton, 500.  
Young, 620.  
Nottingham, 961.  
Apps, 977.  
Nottingham, 991.  
Barker, 993.  
Wilson, 1029.  
Etienne, 1030.  
Ockerby, 1174.  
Day, 1175.

Boxes, lockers, &c. for parcels  
and luggage :

Tull, 12.  
Moore, 49.  
De Lolme, 73.  
Milton, 106.  
Pitt, 154.  
Stead, 159.  
Matthews, 171.  
Wall, 176.

**Boxes, lockers, &c.—cont.**

Newman, 181.  
 Burgess, 186.  
 Bewley, 191.  
 Brown, 232.  
 Bird, 499.  
 Lilly, 513.  
 Newton (*Singer*), 776.  
 Simpson, 865.  
 Clark (*Pradel*), 938.  
 Ward, 964.  
 Apps, 977.  
 Day, 1175.

**Brakes. See also Skidding wheels; Drags.**

Accumulating power for subsequent propulsion;

Van der Byl (*Bell*), 930.  
 Rolfe, 960.  
 Rolfe, 989.

Acting on axle;

Tate, 98.  
 Houlston, 301.  
 Pape, 349.  
 Banks and Banks, 511.  
 Leadbetter, 566.  
 Robson, 629.  
 Lowe, 987.  
 Morel, 1014.

Acting on fly or brake wheel:

Godfrey, 78.  
 Turner, 86.  
 Church, 275.  
 Pearson, 287.  
 Margerison, 526.  
 Stoy, 535.  
 Johnson, 537.  
 Stoy, 550.  
 Kyle, 647.  
 Giles, 794.  
 Dickinson, 811.  
 Richards, 1200 (*Supp.*)  
 Henry (*Stilmant and Al-  
 tain*), 833.  
 Gresham, 873.  
 Brooman (*De Maklakoff*),  
 903.  
 Fowler, 911.  
 Law and Downie, 950.  
 Clark, 981.  
 Long, 1039.  
 Williamson, Lindley, and  
 Coleman, 1122.  
 Freeman and Grundy, 1170.

Acting on nave of wheel;

Jacob, 31.  
 Besant, 51.  
 Lewis, 95.  
 Meyer, 96.  
 Roberts and Brine, 99.  
 Bramah, 120.  
 Le Caan, 123.  
 Taylor, 135.  
 Burstall and Hill, 198.

**Brakes, &c.—cont.**

Acting on nave of wheel—*cont.*

Riley, 224.  
 Johnson, 234.  
 Williams, 242.  
 Pearse, 247.  
 Hynes, 272.  
 Blyth, 280.  
 Poole, 316.  
 Jearrard, 320.  
 Lee, 353.  
 Maberley, 393.  
 Farjon-Demoulin, 515.  
 Hardacre, 623.  
 Lang, 644.  
 Jochem, 787.  
 David and Vercher, 796.  
 Coates, 808.  
 Haworth, 955.  
 Walker, 1169.  
 Clapp, 1178.

Acting on periphery of wheel;

Tindall, 150.  
 Quantin, 262.  
 Aitken, 271.  
 Peppercorn, 299.  
 Shillibeer, 344.  
 Thatcher and Thatcher,  
 354.  
 Warburton, 356.  
 Allier, 392.  
 Miller, 429.  
 Lyall, 453.  
 Newall, 481.  
 Newton, 484.  
 Lovely, 486.  
 Murray, 502.  
 Parsons, 522.  
 Newall, 529.  
 Grist, 531.  
 Jennings, 533.  
 Gaulton, 554.  
 Smith, 589.  
 Napier, 612.  
 Raggett, 656.  
 Cardin, 675.  
 Richardson and Richardson,  
 683.  
 Murdoch (*Clément*), 703.  
 Castle, 718.  
 Anderson, 1194 (*Supp.*)  
 Braby and Braby, 737.  
 Ransley, 766.  
 Hayes, 796.  
 Train, 803.  
 Henry (*Stilmant and Al-  
 tain*), 833.  
 Longshaw, 845.  
 Glatard, 856.  
 Adams, 866.  
 Gedge (*Tabuteau*), 871.  
 Meyer, 887.  
 Meyer, 914.  
 Testuz, 996.  
 Tasker, 1007.  
 Thomson, 1011.  
 Testuz, 1013.

# Brakes, &c.—*cont.*

Acting on periphery of wheel—*cont.*

Newton (*Piatti*), 1099.

Rock, 1118.

Macrum (*Davis*), 1219  
(*Supp.*)

De Witte, 1132.

Acting on rails;

Arrowsmith, 1204 (*Supp.*)

Acting on spokes of wheels;

Wyke, 122.

Taylor, 135.

Reedhead, 257.

Giles, 727.

Actuated by movement of horse,  
&c.:

Quintin, 262.

Shillibeer, 344.

Thatcher and Thatcher, 354.

Iyall, 453.

Jennings, 533.

Smith, 589.

Napier, 612.

Richardson and Richardson,  
683.

Aitchison, 688.

Gedge (*Zempliner*), 689.

Welch, 705.

Biers, 748.

Friou, 777.

Mennons (*Simon*), 806.

Newton (*Piault*), 814.

Watson, 869.

Crane and Ellis, 881.

Thomas, 919.

Gumbley, 934.

Kerr, 949.

Jarvis, 1023.

Roberts, 1066.

Galloway, 1070.

Shaw, 1114.

De Witte, 1132.

Brooman (*Haffner and  
Guillet*), 1166.

Latter, 1176.

Automatic;

Hine, 621.

Meakin, 668.

Adams, 1059.

Griffiths, 1092.

Continuous;

Margerison, 526.

Newall, 529.

Firth, 531.

Stoy, 535.

Johnson, 537.

Stoy, 550.

Leadbetter, 566.

Clement, 592.

Gough and Margerison, 675.

Cloake, 754.

Fleet, Rawlings, and Cloake,  
793.

Abrahams, 978.

Bonneville (*Moineau*), 988.

Testuz, 996.

# Brakes, &c.—*cont.*

Continuous—*cont.*

Long, 1039.

Williamson, Lindley, and

Coleman, 1122.

Richardson and Tait, 1145.

"Dasher" or "cataract";

Carpmael, 279.

Electro-magnetic;

Massi, 898.

Salmon, 1067.

Barnes, Hancock, and

Cowpe, 1071.

Fan;

Shaw, 1096.

Handles for;

Smith, 983.

Momentum;

De St. Charles, 509.

Gough and Margerison, 675.

Mitchell, 1104.

Brooman (*Haffner and  
Guillet*), 1166.

Pneumatic;

Lister, 424.

Jowett, 781.

Morel, 970.

Spring;

Adams and Buchanan, 322.

Adams, 336.

De St. Charles, 509.

Newton, 517.

Buck, 524.

Clement, 592.

Riddell, 724.

Newton (*Piault*), 814.

Clark, 981.

Du Boulay, 1116.

Steam;

Roberts, 253.

Murphy, 617.

Gough and Margerison, 676.

Brooman (*Fleury*), 1012.

Salmon, 1067.

Undescribed;

Knappe, 1.

Nelme, 33.

Broughams. *See Vehicles.*

Buffers:

Bergin, 273.

Rayner, 384.

Adams, 405.

Brockedon and Hancock, 406.

Hadley, 732.

Scott, 753.

Markham (*McIvor*), 1074.

Scott, 1133.

Cabs. *See Vehicles.*

Cart and digging machine  
combined:

Driver, 42.

Palmer, 250.

Cattle, carriage for conveying :

Macpherson, 670.

Centre of gravity of carriages, adjusting. *See* Bodies, &c. ; Boilers, &c.

Commissariat waggon :

Clarke, 851.

Communicating in vehicles :

Bells ;

Richardson, 327.

Franklinsky, 448.

Wheatley, 458.

Banfield, 535.

Aston, 565.

Walsh, 609.

Hadley, 732.

Train, 803.

Indicating direction ;

Adams, 1034.

Gore, 1171.

Knockers ;

Lyall, 605.

Durant, 654.

Speaking tubes ;

Lyde, 63.

Munns, 71.

Collins, 105.

Franklinsky, 448.

Banfield, 535.

Etienne, 1030.

Whistles ;

Walker, 1056.

Couches, &c. for carriages :

Holbeche, 536.

Pollock, 779.

Counting or registering number of passengers :

Benham, 319.

Poole, 319.

Knight, 342.

Ranwell, 368.

Pownall, 437.

Norton, 463.

Newton, 466.

Griffiths, 471.

Anderson, 473.

Henwood, 480.

Horrocks, 486.

Kincaid, 488.

O'Leary, 489.

Finnemore and Chattaway, 512.

Norton, 514.

De la Fons, 516.

Chavanes, 545.

Durant, 587.

Ulrich, 591.

Abraham, 621.

Crofton, 637.

Counting or registering number of passengers—*cont.*

Latham, 637.

Durant, 651.

Sherwood and Wayne, 657.

Parker, 662.

Ther-Katz, 694.

Howells and Howells, 770.

Auerbach (*Schroder and Amuel*), 788.

Cocker, 799.

Cutts, 823.

Cocker, 834.

Curtis, 900.

Curtis, 925.

Clark (*Pradel*), 938.

Cocker, 950.

Crellin, 990.

Kirkland, 1076.

Edwards and Iniff, 1139.

Coupling carriages for common roads :

Brandling, 198.

Bergin, 273.

Adams, 288.

Phillips and Peck, 338.

Ralli, 362.

Anderson, 396.

Clarke and Motley, 433.

Crestadoro, 475.

Burch, 483.

Cloake, 754.

Cook, 928.

Barclay, 958.

Gedge (*Taillendeau*), 1085.

Johnson (*Thiercelin*), 1179.

Coverings of vehicles. *See also* Heads, &c. :

Eyres, Mowate, and Walles, 2.

Poole, 16.

Reddell, 90.

Williams, 115.

Houldsworth, 332.

Brockedon and Hancock, 406.

Horne, Beadon, and Smith, 416.

Brotherhood, 436.

Bycroft, 449.

Lee, 468.

Chatterton, 497.

Rimmel, 557.

Coignet, 575.

Beattie, 585.

North, 598.

Duckett, 610.

Williams, 613.

Rock, 619.

Moreau, 633.

Maberly, 646.

Hodges, 648.

Scowen, 656.

De Clerville, 669.

# Coverings of vehicles—*cont.*

Shillibeer and Giles, 686.  
De Tivoli, 702.  
Gautrot, 712.  
De Brun, 717.  
Thornber, 720.  
Cooke, 763.  
Train, 803.  
Newton (*Castor*), 820.  
Clarke, 851.  
Woodruff and Milnes, 852.  
Prentiss, 920.  
Gallis, 934.  
Ward, 964.  
Leprovost, 968.  
Scowen, 1020.  
Southgate, 1021.  
Salmon, 1067.  
Morgan and Morgan, 1087.  
Riddell, 1088.  
Hazeldine, 1092.  
Lloyd, 1113.  
Harvey, 1173.

# Crane locomotive :

Taylor, 809.  
Gedge (*Taillendeau*), 1085.

# Curricie bar :

Elliott, 95.  
Pope, 207.  
Maughan, 333.

# Cushions :

Eckhardt, 81.  
De Berenger, 107.  
Adams, 405.  
Brockedon and Hancock,  
406.  
Brown, 505.

# Elastic material and stuffing for :

De Berenger, 107.  
Kirrage, 739.  
Headlam, 821.  
Needham, 841.  
Clairmonte, 1168.

# Fibre for stuffing ; Brooman, 720.

# Discharging loads, vehicles arranged for. *See* Unload- ing, &c.

# Distance indicator for car- riages. *See* Indicator dis- tance.

# Doors :

## Fastenings and locks for ;

March, 68.  
Randolph, 121.  
Maberly and Barrow, 151.  
Ranking, 191.  
Pierson, 264.

# Doors—*cont.*

## Fastenings and locks for—*cont.*

Nurse, 504.  
Draper, 674.  
Train (*Musgrove*), 824.  
Hopkins, 980.  
Harrison, 1058.  
Howes and Burley, 1094.

## Making, hanging, and arranging ;

Barber, 67.  
Marsh, 179.  
Weston, 294.  
Hayman, 379.  
Hazeldine, 570.  
Hudson, 613.  
Young, 620.  
Hunt, 622.  
Durant, 654.  
Richardson and Richard-  
son, 706.  
Oxley, 716.  
Hadley, 732.  
Oxley, 740.  
Lyall and Campin, 759.  
Howells and Howells, 770.  
Bigelow (*Harris*), 836.  
Steward, 838.  
La Mothe, 882.  
Nottingham, 961.  
Nottingham, 991.  
Walter, 1004.  
Durant and Gore, 1019.  
Wilson, 1029.  
Harrington, 1098.  
Devilliard and Postweiler,  
1154.  
Gore, 1171.  
Day, 1175.  
Earp and Ashton, 1180.

## Shield or guard for ;

Norton, 698.

# Drags. *See also* Skidding wheels :

Milton, 106.  
Lloyd, 110.

# Drag staves :

Adams, 336.

# Draught, facilitating :

Cole, 7.  
Barlow, 8.  
Godfrey, 78.  
Shorter and Anthony, 82.  
Turner, 86.  
Craigie, 130.  
Doncaster, 152.  
Banks, 160.  
Koster, 166.  
Banks, 168.  
Josephs, 225.  
Ashdowne, 283.  
Peppercorne, 299.  
Bellford, 467.  
De St. Charles, 509.

# Driving gear for propelling carriages and traction engines :

Medhurst, 88.  
 Trevithick and Vivian, 96.  
 Gompertz, 150.  
 Tindall, 150.  
 James, 193.  
 Burstall and Hill, 198.  
 Rawe and Boase, 237.  
 Hanson, 241.  
 Heaton, 243.  
 Napier, 246.  
 Church, 250.  
 James, 254.  
 Millichapp, 266.  
 Church, 275.  
 Carpmael, 279.  
 Gillott and Walker, 315.  
 Hills 331.  
 Hills, 367.  
 Davies, 378.  
 Beaumont, 386.  
 Beadon, 388.  
 Anderson, 396.  
 Horne, Beadon, and Smith, 416.  
 Cooper, 441.  
 Anderson, 473.  
 Rankin, 618.  
 Brooman, 649.  
 Brooman, 660.  
 Fowler, Burton, and Clarke, 666.  
 Wagstaff, 673.  
 Welch, 680.  
 Chaplin, 699.  
 Scotson and Charnley, 721.  
 Romaine, 735.  
 Taylor, 741.  
 Burrell, 743.  
 Bray and Bray, 748.  
 Barrans, 749.  
 Dorman and Cowper, 765.  
 Longstaff and Pullan, 771.  
 Stirling, 790.  
 Giles, 794.  
 Taylor, 798.  
 Taylor, 809.  
 Travis, 816.  
 Rickett, 819.  
 Train (*Grice and Long*), 825.  
 Hodson, 849.  
 Stevens (*Stevens*), 862.  
 Lee and Taplin, 864.  
 Chellingworth and Thurlow, 868.  
 Hawksley, 876.  
 Lee and Taplin, 878.  
 Marshall, 881.  
 Lee, 886.  
 Bray, 888.  
 Pullan and Lake, 889.  
 Selby, 890.  
 Adams, 896.  
 Barclay, 899.

# Driving gear for propelling carriages and traction engines—*cont.*

Evans, 908.  
 Lee, 913.  
 Death, 917.  
 Selby, 1207 (*Supp.*)  
 Lee and Lee, 931.  
 Faulds, 946.  
 Aveling, 947.  
 Law and Downie, 950.  
 Barclay, 958.  
 Rolfe, 960.  
 Morel, 970.  
 Hornsby, Bonnall, and Astbury, 975.  
 Morel, 1014.  
 Roberts, 1015.  
 Lee, 1032.  
 Payne, 1039.  
 Stubber, 1044.  
 Henry (*Gellerat & Cie.*), 1050.  
 Mackenzie, 1080.  
 Alleyne, 1083.  
 Gedge (*Taillendeau*), 1095.  
 Read, 1091.  
 Brooman (*Loubat*), 1100.  
 Keene (*Richards*), 1101.  
 Woodbury, 1112.  
 Du Boulay, 1116.  
 Nicole, 1123.  
 Dwyer and Moon, 1126.  
 Bischoff, 1141.  
 Burrows and Burrows, 1156.  
 Clark, 1160.  
 Appleby, 1163.

# Dynamometer applied to a vehicle :

Hayman, 295.

# Fares, box for receiving :

Slawson, 686.  
 Kerruish, 1037.

# Fares, checking. *See also* Counting, &c.; Indicators (distance, time) :

Newbould, 1057.

# Fastenings for carriage doors. *See* Doors.

# Felloes. *See* Wheels.

# Foot boards :

Tull, 12.  
 Jacob, 33.  
 Moore, 49.  
 Shankster, 56.  
 March, 68.  
 Adams, 288.



Foot boards—*cont.*

Hayman, 379.  
Palliser, 394.  
Nottingham, 991.

## Fore carriages;

O'Keefe, 21.  
Jacob, 31.  
Moore, 49.  
Koster, 92.  
Elliott, 102.  
Heffer, 140.  
Milton, 157.  
Koster, 166.  
Ackermann (*Lenkensperger*), 168.  
Higgins, 185.  
Gunn, 193.  
Burstall and Hill, 198.  
Seaton, 204.  
Hunter, 205.  
Fuller, 216.  
Higgins, 222.  
Brown, 232.  
Mason, 249.  
Gibbs and Chaplin, 252.  
Reedhead, 257.  
Millichap, 266.  
Aitken, 271.  
Adams, 274.  
Reinagle, 284.  
Macnee, 302.  
Buchanan, 335.  
Hunnybun and Venden, 390.  
Adams, 405.  
Horne, Beadon, and Smith, 416.  
Newton, 443.  
Davies, 450.  
Gordon, 484.  
Nunn, 577.  
Miller, 615.  
Scott, 626.  
Brooman, 632.  
Hazelndine, 637.  
Deacon, 638.  
Maberly, 646.  
Brooman, 649.  
Findlater and Keetley, 652.  
Miller, 711.  
Oxley, 740.  
Biers, 748.  
Longstaff and Pullan, 771.  
Lawrence, 779.  
Seton, 785.  
Gladstone, 900.  
Thomas, 919.  
Prentiss, 920.  
Couperie, 959.  
Barker, 993.  
Gedge, 1036.  
Clark (*Duméry*), 1048.  
Griffiths, 1092.  
Puckering, 1148.  
Bräutigam, 1156.

## Framing for vehicles:

Koster, 92.  
Bauer, 97.  
Bosworth, 124.  
Stead, 159.  
Koster, 166.  
Marsh, 179.  
Burgess, 186.  
Gunn, 193.  
Seaton, 204.  
Gurney, 218.  
Wright, 221.  
Josephs, 225.  
Brown, 232.  
Church, 243.  
Church, 250.  
Gibbs and Chaplain, 252.  
Massey, 283.  
Reinagle, 284.  
Kollman, 324.  
Pape, 349.  
Vingoe and Vingoe, 373.  
Rouse, 375.  
Heale, 378.  
Tayler, 394.  
Aitken, 398.  
Stratton, 412.  
Horne, Beadon, and Smith, 416.  
Hazelndine, 444.  
Lyall, 453.  
Scott, 455.  
Dixon and Dodson, 462.  
Davis, 469.  
Simon and Humphreys, 491.  
Davis, 508.  
Dray, 532.  
Esnouf, Mauger, and Lewis, 538.  
Corrall, 540.  
Skertchley, 545.  
Francis, 555.  
Abraham, 602.  
Miller, 615.  
Maberly, 646.  
Miller, 711.  
Hadley, 732.  
Wilson, 806.  
Parsons, 807.  
Bettyes, 822.  
Chellingworth and Thurlow, 835.  
Newton (*Seely*), 835.  
Clarke, 851.  
Lenny, 859.  
Adams, 866.  
Chellingworth and Thurlow, 868.  
La Mothe, 882.  
Rock, 892.  
Bush, 895.  
Pickin and Pickin, 897.  
Death, 917.  
Prentis, 920.  
Christmas, 966.  
Dobbie, 983.  
Christmas, 997.

Framing for vehicles—*cont.*

Adams, 1001.  
 Walter, 1004.  
 Nottingham and Gore, 1004.  
 Durant and Gore, 1019.  
 Turner and Turner, 1034.  
 Adams, 1059.  
 Fuller, Fuller, and Martin,  
 1073.  
 Markham (*McIvor*), 1074.  
 Hazeldine, 1092.  
 Cheffins, 1103.  
 Hazeldine, 1106.  
 Craig, 1115.  
 Clark, 1160.  
 Gore, 1171.  
 Harvey, 1173.

Funeral carriages. *See*  
 Hearses, &c.

## Furniture, carriage :

Pickering, 27.  
 Playfair, 45.  
 Yates, 60.  
 Hands, 64.  
 Newton (*Goodyear*), 453.  
 Poole (*Goodyear*), 463.  
 Harcourt and Harcourt,  
 476.  
 Skertchly, 545.  
 Johnson, 573.  
 Holden, 639.  
 Holden, 655.  
 Clark (*Abeilhou*), 912.

## Gas, vehicle for carriage of :

Brooman (*Rugon*), 624.

## Go-cart :

Askew, 1035.  
 Askew, 1075.

## Hammer-cloth :

Jacob, 31.  
 Clark (*Abeilhou*), 912.

Hand-barrow propelled by  
hand levers :

Clark (*Noël*), 268.

## Hand rails and guards :

Burrell, 152.  
 Haddan, 453.  
 Grafton, 1009.

Hanging carriage bodies. *See*  
Sustaining vehicles ;  
Springs.Hansoms. *See* Vehicles (two-  
wheeled).Hauling carriages and en-  
gines :

Fowler, Burton, and Clarke  
 666.  
 Fowler, 911.  
 Leslie, 922.  
 Roberts, 1015.  
 Cope, 1018.  
 Lee, 1032.  
 Payne, 1039.  
 Keene (*Richards*), 1101.  
 De Mesnil, 1130.

Heads, hoods, and roofs for  
carriages. *See also* Covers,  
&c.

Jacob, 31.  
 Dalton, 111.  
 Birch, 114.  
 Hancock, 143.  
 Matthews, 171.  
 Bower, 283.  
 Adams, 288.  
 Routledge and Galloway,  
 290.  
 Holloway, 321.  
 Beadon, 382.  
 Duncan, 410.  
 Davies, 425.  
 Newton, 443.  
 Rock, 446.  
 Simon and Humphrey, 491.  
 Holbeche, 536.  
 Gerner, 549.  
 Surgey, 563.  
 North, 598.  
 Lenny, 599.  
 Abraham, 602.  
 Roberts, 620.  
 Hardacre, 623.  
 Meakin, 668.  
 Newton (*Castor*), 820.  
 Shillibeer and Giles, 823.  
 Holmes, 856.  
 Rock, 892.  
 Morgan and Morgan, 893.  
 Prentiss, 920.  
 Snider, 935.  
 Nottingham, 961.  
 Nottingham, 991.  
 McKenzie, 1008.  
 Durant and Gore, 1019.  
 Martin, 1025.  
 Martin, 1060.  
 Fuller, Fuller, and Martin,  
 1073.  
 Harrington, 1098.  
 Cheffins, 1103.  
 Rock, 1118.  
 Russell, 1124.  
 Rock, 1136.  
 Botwood, 1181.  
 Morgan and Morgan, 1182.

## Hearses and funeral carriages :

Shillibeer, 344.  
 Lyall, 453.  
 Massingham, 481.  
 Abraham, 523.  
 Butler, 677.  
 Walker, 729.  
 Hadley, 732.  
 Storer, 751.  
 Whitgrove, 847.  
 Ridges and Barker, 874.  
 Millington, 898.  
 Cresswell and Greves, 941.

## Hinges for carriage doors :

Prior, 318.  
 Rock, 619.  
 Maberly, 646.  
 Holden, 655.  
 Oxley, 716.

Hoods for vehicles. *See*  
 Covers, &c. ; Heads, &c.

## Horses, carriage for training :

Bunting, 928.

Horses, carriage to facilitate  
 progression of :

Peppercorne, 299.  
 Moat, 309.

## Horses, controlling :

Meyer, 96.  
 Cook, 203.  
 Thomas, 304.  
 Bertrand, 436.  
 Walthew, 1000.  
 Rothwell, 1077.

## Horses, raising from ground :

Parkin, 314.  
 Walthew, 1000.

Horses (runaway) disengaging  
 from vehicles :

Worcester, 2.  
 Lugg, 11.  
 Hillcoat, 22.  
 March, 68.  
 De Lolme, 73.  
 Reddell, 90.  
 Pottinger, 94.  
 Lewis, 95.  
 Williams, 97.  
 Roberts and Brine, 99.  
 White, 137.  
 Riley, 224.  
 Williams, 242.  
 Quaintin, 262.  
 Pope, 334.  
 Newton, 478.  
 L'Hernault and Richard,  
 494.

Horses (runaway) disengaging,  
 &c. — *cont.*

Newton, 500.  
 Newton, 517.  
 Webster (*Webster*), 536.  
 Cowan, 719.  
 Friou, 777.  
 Ferry, 796.  
 Orange, 814.  
 Glatard, 856.  
 Millin, 984.  
 Etienne, 999.  
 Hofmann, 1014.  
 Etienne, 1030.  
 Hofmann, 1048.  
 Marvaud, 1079.  
 Holmes, 1106.  
 Marvaud, 1111.  
 Gedge (*Larivière*), 1164.  
 Newton (*Ducruix*), 1184.

House carts. *See* Vehicles  
 (with living or sleeping  
 accommodation).Hubs. *See* Wheels (naves).

## Indicators :

## Distance ;

Van Berg, 2.  
 Gout, 62.  
 Reddell, 90.  
 Miller, 104.  
 Routledge and Galloway,  
 290.  
 Gillett and Chapman, 291.  
 Davis, 345.  
 Von Uster, 395.  
 Grayson, 456.  
 Norton, 463.  
 Newton, 466.  
 Davis, 469.  
 Griffiths, 471.  
 Norton, 514.  
 De la Fons, 516.  
 Chavanes, 545.  
 Quinche, 653.  
 Sherwood and Wayne, 651.  
 Auerbach (*Schroder and*  
*Amuel*), 788.  
 Hore, 1204 (*Supp.*)  
 Curtis, 900.  
 Adcock, 1207 (*Supp.*)  
 Curtis, 925.  
 Clark (*Pradel*), 938.  
 Rowland, 1209 (*Supp.*)  
 Bruet, 962.  
 Lange, 1212 (*Supp.*)  
 Gaskell, 997.  
 Henry (*Ducoux*), 1027.  
 Brooman (*Claustre*), 1053.  
 Pinaud, 1061.  
 Bathias, 1218 (*Supp.*)  
 Julien, 1219 (*Supp.*)  
 Clark (*Ramon-y-Garcia*),  
 1155.

Indicators—*cont.*Distance—*cont.*

Monnin and Boissenot, 1170.  
Bathias, 1221 (*Supp.*)  
Clark (*Delaunay*), 1182.

## Showing whether vehicle is disengaged ;

Vazie, 109.  
Chavanes, 545.  
Quinche, 653.  
Ther-Katz, 694.  
Clark, 938.  
Clark (*Pradel*), 938.  
Sutton, 940.  
Bruet, 962.  
Henry (*Ducoux*), 1027.  
Avy, 1121.

## Speed ;

Van Berg, 2.

## Time ;

Chavanes, 545.  
Johnson (*Bréguet*), 696.  
Bonneau, 751.  
Curtis, 925.  
Clark (*Pradel*), 938.  
Sutton, 940.  
Bruet, 962.  
Henry (*Ducoux*), 1027.  
Clark, 1043.  
Brooman (*Claustre*), 1053.  
Pinaud, 1061.  
Avy, 1121.  
Clark (*Ramon-y-Garcia*), 1155.  
Gedge (*Priou*), 1220 (*Supp.*)  
Monnin and Boissenot), 1170.  
Clark (*Delaunay*), 1182.

Indicators for registering number of passengers. *See* Counting, &c.

## Invalid carriages and ambulances :

Van Berg, 2.  
Burton, 520.  
Holbeche, 536.  
Metcalf, 556.  
Metcalf, 560.  
Hazeldine, 570.  
Nunn, 577.  
Beattie, 585.  
Abraham, 586.  
Smith, 587.  
Kennard, 595.  
Abraham, 602.  
Williams, 650.  
Gourley, 687.  
Thornber, 720.  
Lawrence, 779.  
Pollock, 779.  
Boyd, 798.

Invalid carriages—*cont.*

De Tivoli, 808.  
Clarke, 851.  
Hill, 894.  
Lewis, 948.  
Christmas, 966.  
Bonneville (*Sargent*), 967.  
Askew, 1035.  
Steevens, 1035.  
Askew, 1075.  
Newton (*Quitow*), 1089.

Joining metal plates to be used in carriages :  
Collins, 608.

Knees for carriages, metal.  
*See also* Framing for vehicles :

Clay, 689.

Lace and fringe for carriages :

Hancock, 393.

Ladder for omnibus :

Cocker, 799.  
Newton (*Castor*), 820.

Lamp irons :

Cockings and Potts, 591.  
Holden, 639.  
Howes and Burley, 798.  
Howes and Burley, 1094.  
Johnson (*Thiercelin*), 1179.

Lamplighter, vehicle for :

Allnutt, 726.

Leather for carriages, treating :

Hurn and Hurn, 1128.

Leather for covering carriages, substitute for :

Hooper, 63.  
Rimmel, 557.  
Hackett, 567.  
Coignet, 575.  
Newton, 704.  
De Brun, 717.  
Clark (*Abeilhou*), 912.  
Kirrage, 972.  
Clarkson, 992.  
Russell, 1124.

Letter-box for carriages :

Wright, 853.

Lighting carriages :

Claggett, 36.  
March, 68.  
De Lolme, 73.

Lighting carriages—*cont.*

Wheatley, 458.  
Hadley, 732.  
Brant, 1057.  
Raney, 1105.

Linch pins :

Halladay, 81.  
Collinge, 128.  
Spratley, 145.  
Matthews, 171.  
Smith, 933.

Lining for carriages :

Hancock, 393.  
Brockedon and Hancock,  
406.  
Bird and Welch, 476.  
Smith, 587.  
Hodges, 648.  
Austin, 940.

Lining to bodies, attaching :

Macdonald, 1052.

Liquids, cart for :

Salter, 426.  
Hall, 477.  
James, 525.  
Carey, 624.  
Steevens, 1035.

Litters :

Van Berg, 2.  
Boyd, 798.

Load adjusting :

Craigie, 130.  
Pope, 155.  
Pearse, 247.  
Bacon, 274.  
Newton, 478.  
Begbie, 495.  
Parfitt, 522.  
Jennings, 533.  
Abraham, 602.  
Portus, 629.  
Brooman, 649.  
Playle, 698.  
Mainwaring, 745.  
Smith, 746.  
Lyall and Campin, 759.  
Marshall, 881.  
Castelnau, 995.  
Tasker, 1007.  
Friend, 1141.

Loading and unloading, carts  
with special arrangements  
for :

Gedge (*Massé*), 1138.  
Cambridge, 1157.

Locking wheels to facilitate  
turning. *See also* Fore car-  
riages.

Ladd, 14.  
James and Mason, 26.  
O'Keefe, 34.  
Wilks, 145.  
Gordon, 183.  
Higgins, 185.  
Routledge and Galloway,  
290.  
Prior, 318.  
Adams and Buchanan, 322.  
Kollman, 324.  
Buchanan, 335.  
Adams, 336.  
Phillips and Peck, 338.  
Warburton, 356.  
Wilkey, 359.  
Rock, 446.  
Maude, 505.  
Offord, 562.  
Lyall, 605.  
Rock, 619.  
Roberts, 620.  
Findlater and Keetley, 652.  
Murdoch, 667.  
Taylor, 741.  
Wright (*De St. Marc*), 781.  
Seton, 785.  
Gladstone, 900.  
Thomas, 919.  
Prentiss, 920.  
Abel (*Audineau*), 952.  
Barker, 993.  
Hofmann (*Duméry*), 1048.  
Puckering, 1148.

Locks and fastenings for car-  
riage doors, &c. *See* Doors.

Look-out glasses :

Galloway, 1070.

Lubricating axles. *See* Axles,  
&c.

Minerals, carriages for :

Stokoe, 25.

Naves. *See* Wheels.

Omnibuses :

Adams, 288.  
Routledge and Galloway,  
290.  
Richardson, 327.  
Warburton, 356.  
James, 357.  
Hazeldine, 361.  
Hayman, 379.  
Moor, 380.  
Hunnybun and Venden, 390.  
Bishop and Wood, 400.  
Adams, 405.

Omnibuses—*cont.*

Franklinsky, 448.  
 Bunnett, 449.  
 Lyall, 453.  
 Scott, 455.  
 Wheatley, 458.  
 Green, 472.  
 Newton, 478.  
 Lovely, 486.  
 Von Rathen, 534.  
 Gerner, 549.  
 Abraham, 602.  
 Lyall, 605.  
 Haddan, 607.  
 Walsh, 609.  
 Ward, 611.  
 Williams, 613.  
 Miller, 615.  
 Carey, 617.  
 Roberts, 620.  
 Scott, 626.  
 Durant, 654.  
 Curtis, 659.  
 Taylor, 677.  
 Shillibeer and Giles, 686.  
 De Tivoli, 702.  
 Richardson and Richardson,  
 706.  
 Miller, 711.  
 Gautrot, 712.  
 Ayshford, 716.  
 Riddell, 724.  
 Hill, 736.  
 Lyall and Campin, 759.  
 Ransley, 766.  
 Cocker, 799.  
 Newton (*Castor*) 820.  
 Shillibeer and Giles, 823.  
 Bigelow (*Harris*), 836.  
 Bush, 891.  
 Bush, 895.  
 Abel (*Audineau*), 952.  
 Bray, 959.  
 Cheffins, 1103.  
 Harvey, 1173.

## Omnibuses, name board for:

Taylor, 677.  
 Gautrot, 212.

One-wheeled vehicles. *See*  
 Vehicles (one-wheeled):

## Ornamenting carriages:

Bedford, 17.  
 Jacob, 33.  
 Hatchett, 33.  
 Skidmore, 51.  
 Hands, 64.  
 Clay, 71.  
 Dowling, 774.  
 Barre and Barre, 778.  
 Hilliar, 942.  
 Ashberry, 1144.

## Oscillation, preventing:

Schiele, 524.

## Overturning, preventing:

Clignett, 4.  
 Greene, 4.  
 Ogilby, 5.  
 Jackson, 6.  
 Jackson, 7.  
 Trengrouse, 8.  
 De la Chaumette, 8.  
 Dunning, 9.  
 Hawkes, 13.  
 Moore, 46.  
 Meares, 51.  
 Besant, 51.  
 Davis, 55.  
 Shankster, 56.  
 Hatchett, 58.  
 March, 68.  
 Vulliamy, 69.  
 William, 115.  
 Dumbell, 116.  
 Stracey, 118.  
 Wyke, 122.  
 Snowden, 161.  
 Roberts, 174.  
 Bewley, 191.  
 Isaacs, 192.  
 Pyke, 199.  
 Hirst, W. and H., Heycock,  
 and Wilkinson, 203.  
 Pope, 207.  
 Birt, 208.  
 Fuller, 216.  
 Douglas, 266.  
 Gaury, 340.  
 Etienne, 999.  
 Etienne, 1030.

## Painting carriages:

Hatchett, 43.  
 Froggott, 459.

## Panels:

Composition;  
 Pidding, 460.  
 Gee, 841.  
 Bielefeld, 965.  
 Peterson, 972.

Cork and other materials com-  
 bined:

Clarkson, 606.  
 Clarkson, 992.

## Gutta-percha and india-rubber:

Wilson, 483.  
 Goodyear, 585.  
 Newton, 719.  
 Offord, 843.

## Metal:

Poole, 16.  
 Moore, 46.  
 Reinagle, 284.  
 Heale, 378.

## Panels—*cont.*

### Metal—*cont.*

Aitken, 398.  
 Adams, 405.  
 Francis, 555.  
 Smith, 587.  
 Kennard, 595.  
 Francis and Manby, 693.  
 Newton (*Seely*), 835.  
 Williams, 859.  
 La Mothe, 882.  
 Pickin and Pickin, 897.  
 Robotham, 938.  
 Leprovost, 968.  
 Saunders, 1213 (*Supp.*)  
 Macdonald, 1052.  
 Salmon, 1067.  
 Hazeldine, 1092.  
 Craig, 1115.

### Paper;

Clay, 32.  
 De Bergue and Haddan,  
 412.  
 Hutchison, 422.  
 Haddan, 453.  
 Broad, 651.  
 Martin and Pidding, 800.  
 Nottingham and Gore, 1004.  
 Durant and Gore, 1054.

### Slate, &c. ;

Clay, 71.

### Various ;

Hatchett, 43.  
 Burgess, 186.  
 Reinagle, 234.  
 Rock, 446.  
 Nottingham and Gore, 1004.

## Paper, constructing carriage bodies of. *See also* Panels, paper :

Ducrest, 60.  
 Hutchison, 422.  
 Haddan, 453.

## Papier maché for carriages.

*See also* Panels, paper :

White and Parlbby, 706.  
 Gore, 1171.

## Passengers, registering num- ber of. *See* Counting, &c.

## Perambulators ;

Burton, 520.  
 Schmooock, 544.  
 Metcalfe, 556.  
 Nunn, 577.  
 Wren, 584.  
 Smith, 587.  
 Geyelin, 594.  
 Kennard, 595.  
 Hine, 621.

## Perambulators—*cont.*

Biggs, 668.  
 Meakin, 668.  
 Tall, 707.  
 Thornber, 720.  
 Hadley, 732.  
 Lawrence, 779.  
 Smith, 782.  
 Reynolds and Dance, 784.  
 Boyd, 798.  
 Woodruff and Milnes, 852.  
 Bartholf (*Hartson*), 866.  
 Hill, 894.  
 Lewis, 948.  
 Lloyd, 1069.  
 Tiffin, 1177.

## Perch bolts :

Stracey, 118.  
 Macnee, 301.  
 Holmes, 1106.

## Perches

Moore, 46.  
 Moore, 49.  
 Meares, 51.  
 Hatchett, 58.  
 Godfrey, 78.  
 Stracey, 118.  
 Randolph, 121.  
 Brown, 133.  
 Banks, 160.  
 Wyke and Shorter, 164.  
 Marsh, 179.  
 Higgins, 185.  
 Burstall and Hill, 198.  
 Higgins, 222.  
 Gibbs and Chaplin, 222.  
 Gibbs and Applegarth, 255.  
 Peppercorne, 299.  
 Macnee, 301.  
 Moat, 329.  
 Simon and Humphreys,  
 491.  
 Offord, 562.  
 Wright (*De St. Marc*), 781.  
 Rock, 892.  
 Gladstone, 900.  
 Etienne, 1030.  
 Holmes, 1106.

## Platform for pony :

Viney and Pocock, 211.

## Poles :

Vulliamy, 69.  
 Wildey, 84.  
 Lewis, 95.  
 Williams, 97.  
 Koster, 166.  
 Fuller, 189.  
 Ryder, 199.  
 Easton, 204.  
 Burges, 215.  
 Reinagle, 284.  
 Weston, 294.  
 Chinnock, 414.

Poles—*cont.*

Hazeldine, 445.  
 Corral, 540.  
 Genetreau, 553.  
 Swift, 604.  
 Brooman, 632.  
 Hazeldine, 637.  
 Clarke, 690.  
 Train, 803.  
 Adams, 866.  
 Ashley, 884.  
 Haseltine (*Derby*), 934.  
 Etienne, 999.  
 Johnson (*Thiercelin*), 1179.  
 Haseltine (*Perry*), 1184.

## Postillion's seat attached to carriage:

Pidding, 408.  
 Pidding, 460.  
 Sursey, 563.

## Poultry (live) waggon:

Brooman (*Giot*), 790.

## Press (packing) applied to waggons, &amp;c.:

Walker and Warner, 1151.

## Propelling vehicles, arrangements for:

Bars clipping the wheels;  
 Moore, 234.

## Compressed air:

Medhurst, 88.  
 Dumbell, 116.  
 Hall, 212.  
 Wright, 221.  
 Douglas, 266.  
 Pinkus, 1189 (*Supp.*)  
 Morison, 419.  
 Daniell, 491.  
 Henry (*Gallegos*), 837.  
 Coffey, 954.  
 Mackenzie, 1080.

## Horses, &amp;c. on moveable platforms, &amp;c.:

Harsleben, 281.  
 Curtis, 305.  
 Miller, 430.  
 Crestadoro, 474.

## Hydraulic power;

Dwyer and Moon, 1126.

## Manual power, treadles, &amp;c.

Moore, 27.  
 Halladay, 81.  
 Van Heythuysen, 182.  
 Holland, 219.  
 Ruthven, 238.  
 Branley and Parker, 244.  
 Cochrane, 248.  
 Metcalfe, 385.  
 Morison, 419.  
 Farries, 420.  
 Price, 427.

Propelling vehicles, arrangements for—*cont.*Manual power, treadles, &c.—*cont.*

Mills, 510.  
 Cannon, 513.  
 Konig, 551.  
 Guillaume, 580.  
 Parker, 614.  
 Rankin, 618.  
 Pichler and Wigley, 786.  
 Henry (*Gallegos*), 837.  
 Poulson, 843.  
 Hildebrand, 861.  
 Marsily, 866.  
 Evans, 908.  
 Mackenzie and Smith, 927.  
 Edge, 933.  
 Orłowski, 936.  
 Rolfe, 960.  
 Clark (*Noël*), 968.  
 Williams, 975.  
 Hodson, 979.  
 Rolfe, 989.  
 Goodrich, 1026.  
 Du Boulay, 1068.  
 Lane, 1082.  
 Read, 1091.  
 Du Boulay, 1116.  
 Gilman, 1165.

## Oscillation of weights;

Crabtree, 228.  
 Quaintin, 261.  
 Anderson, 396.  
 Newton, 484.  
 Anderson, 1194 (*Supp.*)  
 Hadley, 733.  
 Henry (*Gallegos*), 837.  
 Williams, 975.

## Pushing by struts or props:

Pratt, 1185 (*Supp.*)  
 Mead, 1186 (*Supp.*)  
 Brunton, 142.  
 Baynes, 177.  
 Dumbell, 189.  
 Gordon, 195.  
 Gurney, 201.  
 Crabtree, 228.  
 Boydell, 1187 (*Supp.*)  
 Clark, 312.  
 Nicolas, 327.  
 Davies, 346.  
 Teissier and Triat, 1189 (*Supp.*)  
 Sager, 431.  
 De Nanteuil, 1191 (*Supp.*)  
 Goble, 1192 (*Supp.*)  
 Giles, 727.  
 Brennand, 761.  
 Taylor, 798.  
 Paterson, 1197 (*Supp.*)  
 Hodson, 849.  
 Paraire, 858.  
 Newton (*Dickson & Jones*), 1209 (*Supp.*)  
 Henry (*Bernie and Desmarest*), 1074.



Propelling vehicles, arrange-  
ments for—*cont.*

- Rotation of fly-wheel ;  
Swinburne, 1103.
- Spiked wheels ;  
Seaward and Seaward, 1181  
(*Supp.*)
- Spiral screw blades ;  
Duncan, 1192 (*Supp.*)
- Springs ;  
Maberly, Branwhite, and  
Lusher, 404.  
Dewsnup, 513.  
Pensam, 874.  
Neall, 910.  
Coffey, 954.  
Markham (*McIvor*), 1074.

- Steam power ;  
Trevithick and Vivian, 96.  
Dumbell, 116.  
Blenkinsop, 131.  
Tindall, 150.  
Reynolds, 157.  
Gordon, 183.  
Griffith, 184.  
James, 193.  
Burstall and Hill, 198.  
Burstall and Hill, 210.  
Andrews, 212.  
Hall, 212.  
Neville, 213.  
Gurney, 218.  
Harland, 220.  
Gough, 220.  
Witty, 245.  
Napier, 246.  
Church, 250.  
Roberts, 253.  
James, 254.  
Gibbs and Applegarth, 255.  
Gordon, 257.  
Hick, 268.  
Bacon, 274.  
Church, 275.  
Carpmael, 279.  
Clark, 312.  
Moat, 329.  
Hills, 367.  
Davies, 378.  
McIntosh, 1190 (*Supp.*)  
Miller, 430.  
Sagar, 431.  
Clarke and Motley, 433.  
Anderson, 473.  
Lovely, 486.  
Wagstaff, 673.  
Giles, 727.  
Brennand, 742.  
Poulson, 843.  
Paraire, 858.  
Law and Downie, 950.  
Rolfé, 960.

Undescribed ;  
Leighton, 3.

Propelling vehicles, arrange-  
ments for—*cont.*

- Winches, &c. ;  
Ladd, 14.  
Beaumont, 59.  
Godfrey, 78.  
Halladay, 81.  
Chapman and Chapman, 141.  
Snowden, 196.  
Saxton, 256.
- Wind power ;  
Hadley, 5.  
Moore, 30.  
Besant, 64.  
Medhurst, 88.  
Tindall, 150.  
Viney and Pocock, 211.]  
Williams, 975.

Protecting and arming vehi-  
cles :

- Bewley, 191.  
Quaintin, 261.  
Bird and Welch, 476.  
Gore, 1171.

“ Putting to ” horses. *See*  
Attaching, &c.

Rail and road clearer :

- Train (*Musgrove*), 824.  
Greaves, 829.  
Shepard, 1204 (*Supp.*)  
Adams, 866.  
Goodrich, 1026.  
Ward, 1216 (*Supp.*)  
Salmon, 1067.  
Woodbury, 1112.

Railways, portable endless :

- Edgeworth, 1185 (*Supp.*)  
Barry, 182.  
Cayley, 1187 (*Supp.*)  
Hunter, 205.  
Gillet, 245.  
Ashdowne, 283.  
Nicolas, 327.  
James, 357.  
Leahy, 1190 (*Supp.*)  
Boydell, 400.  
Wrigg, 402.  
Pidding, 408.  
Morrison, 419.  
Lillie, 1190 (*Supp.*)  
Pidding, 460.  
Marshall, 470.  
Boydell, 534.  
Raywood, 1192 (*Supp.*)  
Cambridge, 1193 (*Supp.*)  
Cambridge, 644.  
Dumarchey, Levy, and  
Mayer, 647.  
Parkes, 652.

# Railways, portable endless— cont.

Anderson, 653.  
Brooman, 660.  
Ford, 663.  
Remington and Balcombe,  
665.  
Fowler, Burton, and Clarke,  
666.  
Fulton and Eddy, 668.  
Newton, 669.  
Cambridge, 671.  
Clark, 676.  
Anderson, 679.  
Welch, 680.  
Whytock, 713.  
Anderson, 714.  
Welch, 714.  
Scotson and Charnley, 721.  
Anderson, 1194 (*Supp.*)  
Rickett, 729.  
Fowler and Burton, 730.  
Thurnham, 736.  
Braby and Braby, 737.  
Burrell, 743.  
Romaine, 1194 (*Supp.*)  
Boydell, 757.  
Leatry, 761.  
Savage, 762.  
Seton, 785.  
Welch (*Welch*), 792.  
Stephens, 813.  
Peacock and Truman, 817.  
Dunlop, 860.  
Simonton, 867.  
Ingram, 872.  
Gilbert, 1205 (*Supp.*)  
Pullan and Lake, 889.  
Brooman (*De Maklaff*),  
903.  
Molyneux, 936.  
Chapman, 1007.  
Molyneux, 1216 (*Supp.*)  
Nicole, 1123.  
Dwyer and Moore, 1126.

# Raising and lowering appa- ratus forming part of ve- hicles :

Gedge (*Massé*), 1138.  
Cambridge, 1157.

# Registering number of pas- sengers. *See* Counting, &c.

# Rein bearer :

Young, 620.  
Newton (*Singer*), 776.  
Davis, 876.  
Davies (*Singer*), 1149.

# Reins, hook for :

Roberts, 539.

# Releasing runaway horses. *See* Horses (runaway), &c. :

# Rocking or undulating car- riages :

Ianowski, 880.

# Rollers as vehicles :

Swinburne, 1189 (*Supp.*)  
Moseley, 607.  
Blackburn and Blackburn,  
1193 (*Supp.*)  
Blackburn and Blackburn,  
1195 (*Supp.*)  
Blackburn, 1211 (*Supp.*)

# Rollers as wheels. *See* Wheels, (substitute for) :

Edisbury, 5.  
De Fontainemoreau, 658.  
Hopkins and Pearce, 663.  
Travis, 816.  
Clark and Batho, 1003.

# Rollers, connecting wheels to form :

Lee, 913.

# Rollers, steam road :

Clark and Batho, 1003.

# Roofs for carriages. *See* Coverings, &c.; Heads, &c. :

# Root cutter cart :

Caldow and McKinnel, 582.

# Runaway horses in carriages, releasing. *See* Horses (run- away), &c.

# Scrapers for wheels. *See also* Wheels, removing dirt from :

Brandling, 198.  
Bower, 489.  
Fontenau, 553.  
Hart, 1160.

# Screens for carriages :

Newton (*Seely*), 835.

# Seats. *See also* Cushions :

Foster, 22.  
Besant, 64.  
Eckhardt, 81.  
Reddell, 90.  
Miller, 104.  
De Berenger

Seats—*cont.*

Randolph, 121.  
 Stead, 159.  
 Matthews, 171.  
 Marsh, 179.  
 Burgess, 186.  
 Miniken, 223.  
 Barlow, 270.  
 Benham, 319.  
 Houldsworth, 333.  
 Heale, 378.  
 Hancock, 393.  
 Adams and Richardson, 414.  
 Simon and Humphreys, 491.  
 Brown, 505.  
 Holbeche, 536.  
 Roberts, 539.  
 Offord, 562.  
 Surgey, 563.  
 Smith, 594.  
 Lyall, 605.  
 Carey, 617.  
 Young, 620.  
 Williams, 650.  
 Durant, 654.  
 Gourley, 687.  
 Searby, 691.  
 Reilly, 700.  
 Ayshford, 716.  
 Cottam, 739.  
 Dewey (*Robinson*), 767.  
 Pollock, 779.  
 Boyd, 798.  
 Newton (*Castor*), 820.  
 Simpson, 865.  
 Newton (*Rainey*), 870.  
 Prentiss, 920.  
 Fournier, 922.  
 Burnett, 923.  
 Ward, 964.  
 Christmas, 966.  
 Bonneville (*Sargent*), 967.  
 Barker, 993.  
 McDowell, 1022.  
 Bottomley, 1033.  
 Kirkland, 1076.  
 Dummere, 1131.  
 Burrows and Burrows, 1156.  
 Clairmonte, 1168.  
 Williams, 1168.

## Sedans :

Barlow, 270.

## Sedans on wheels :

Tull, 12.  
 Burton, 520.

## Shafts :

Vulliamy, 69.  
 Overend, 80.  
 Wildey, 84.  
 Williams, 97.  
 Morton, 156.  
 Koster, 166.  
 Woollams, 188.  
 Fuller, 189.

Shafts—*cont.*

Brandling, 198.  
 Hill, 199.  
 Pyke, 199.  
 Pope, 207.  
 Burges, 215.  
 Poole, 235.  
 Poole, 286.  
 Weston, 294.  
 Maughan, 333.  
 Pope, 334.  
 Wright, 340.  
 Smith, 386.  
 Chinnock, 414.  
 Davis, 469.  
 Newton, 496.  
 Emery, 498.  
 Newton, 517.  
 Glover, 541.  
 Maggs, 544.  
 Nicholson, 546.  
 Genetreau, 553.  
 Glover, 560.  
 Young, 620.  
 Brooman, 632.  
 Williams, 650.  
 Sanderson, 658.  
 Shakespeare, 682.  
 Clarke, 690.  
 Playle, 698.  
 Scott, 753.  
 Lawrence, 779.  
 Orange, 814.  
 Ashley, 884.  
 Carter, 908.  
 Burnett, 923.  
 Rimmer, 939.  
 Parker, 945.  
 Millin, 984.  
 Nottingham, 991.  
 Barker, 993.  
 Castelnau, 995.  
 Etienne, 999.  
 McDowell, 1022.  
 Davies (*Singer*), 1149.  
 Botwood, 1153.  
 Gore, 1171.  
 Ockerby, 1174.  
 Haseltine (*Perry*), 1184.

## Shafts, guard for :

Davies (*Singer*), 1149.

## Shutters :

Laycock, 26.  
 Moore, 46.  
 Marsh, 179.  
 Cook, 239.  
 Snider, 935.  
 Nottingham, 961.  
 Nottingham, 991.  
 Riddell, 1088.

## Signalling approach of vehicles :

Dumbell, 116  
 James, 254.

## Skidding wheels :

Isherwood, 61.  
 March, 68.  
 German, 93.  
 Lewis, 95.  
 Roberts and Brine, 99.  
 Bramah, 120.  
 Thompson, 132.  
 Silvester, 136.  
 Clark, 171.  
 Ruthven, 174.  
 Huggett, 177.  
 Johnson, 190.  
 Gunn, 193.  
 Birt, 208.  
 Viney and Pocock, 211.  
 Parker, 226.  
 Sculthorpe, 229.  
 Williams, 242.  
 Boys, 253.  
 Rees, 260.  
 Tongue, 267.  
 Simpson, 277.  
 Whitche, 289.  
 Peppercorne, 299.  
 Wright, 340.  
 Fuller, 343.  
 Maberly, Branwhite, and  
 Lusher, 404.  
 Bates, 473.  
 Crestadoro, 474.  
 Gougy and Combe, 490.  
 De la Fons, 491.  
 L'Hernault and Richard, 494.  
 Marychurch and Griffiths,  
 627.  
 Brooman, 649.  
 Durant, 654.  
 Oldershaw, 659.  
 Snell, 679.  
 De la Fons, 692.  
 Murdoch (*Clément*), 703.  
 Davis, 718.  
 Mainwaring, 745.  
 Poupard, 750.  
 Ferry, 796.  
 Peake, 830.  
 Newton (*Caporn*), 877.  
 Hagget, 906.  
 Meyer, 914.  
 Williams, 975.  
 Wilmot (*Douglas*), 979.  
 Clark, 981.  
 Millin, 984.  
 Eynard, 990.  
 Tasker, 1007.  
 Brooman (*Fleury*), 1012.  
 Dobbs, 1095.  
 Warburton, 1115.  
 Dobbs, 1125.  
 Phillips-Smith, 1165.

## Sledges :

Hatchett, 58.  
 Francis, 555.  
 Thompson, 593.  
 Burnett, 923.  
 De Neviers, 118

Smoke and steam, preventing  
visible emission of in com-  
mon road steam carriages :

Dircks, 331.  
 Anderson, 473.  
 Anderson, 714.  
 Taylor, 798.  
 Rickett, 819.  
 Galloway, 1070.  
 Burrows and Burrows, 1156.

## Spheres as wheels :

Goupil, 1208 (*Supp.*)

## Spherical vehicles :

Symes, 1017.

Splinter bars. *See also* Horses,  
disengaging :

Hatchett, 58.  
 Leedham, 66.  
 Turner, 86.  
 Pottinger, 94.  
 Williams, 97.  
 Ackermann (*Lenkensper-  
ger*), 168.  
 Fuller, 189.  
 Birt, 208.  
 Burges, 215.  
 Buchanan, 335.  
 Rock, 892.  
 Bonneville (*Beguin*), 983.  
 Etienne, 999.  
 Johnson (*Thiercelin*), 1179.

Spokes and spoke shoes. *See*  
Wheels.

## Springs :

## Bar ;

Newton (*Perraton and  
Cail and Co.*), 769.  
 Gibson and Turner, 962.

## Coiled ;

Hill, 3.  
 Rogers, 10.  
 Hatchett, 24.  
 Jacob, 29.  
 DeLolme, 73.  
 Wyke and Shorter, 161.  
 Griffith, 184.  
 Lacy, 212.  
 Poole, 235.  
 Gibbs, 268.  
 Whiteside, 269.  
 Aitken, 271.  
 Smith, 332.  
 Pape, 349.  
 Heale, 378.  
 Gollop, 383.  
 Aitken, 398.  
 Paradis, 439.  
 Davis, 469.  
 Smith, 495.

Springs—*cont.*

Coiled—*cont.*

Myers, 584.  
Raywood, 1192 (*Supp.*)  
Chrimes, 622.  
Maberly, 646.  
Reading, 661.  
Bousfield, 695.  
Rishworth, 703.  
Hadley, 732.  
Spencer, 743.  
Fuller, 768.  
Mickles (*Johnson*), 773.  
Henson, 810.  
Newton (*Jerrold, Beggs, and Scott*), 820.  
Whitby and Dempsey, 820.  
Train (*Grice and Long*), 825.  
Rimmer, 939.  
Gibson and Turner, 962.  
Hornsby, Bonnal, and Astbury, 975  
Durant and Gore, 1019.  
Lee, 1032.  
Evans, 1131.  
Hadley, 1144.

Covering with waterproof material;

Braby and Braby, 737.

Disc;

Gardiner, 854.

Galvanized;

Horne, Beadon, and Smith, 416.

Hydraulic;

Rayner, 384.  
Richardson and Richardson, 706.

India-rubber;

Lacy, 202.  
Hancock, 393.  
De Bergue and Haddan, 412.  
De Bergue, 419.  
Newall, 431.  
Scott, 457.  
Coleman, 1191 (*Supp.*)  
Bellford, 467.  
Fuller and Knevitt, 473.  
Crestadoro, 474.  
Oates, 475.  
Smithson and Adam, 482.  
Burch, 483.  
Bell, 501.  
Leverson, 506.  
Gaskell, 508.  
Spencer, 510.  
Adams, 558.  
Fuller, 562.  
Préaud, 601.  
Myers, 607.  
Hooper, G. N. and W., 609.  
Roberts, 620.  
Hooper, Fry, and Nasmyth, 643.

Springs—*cont.*

India-rubber—*cont.*

Eaton, 644.  
Booth, 722.  
Oxley, 740.  
De Forest (*Goodyear*), 747.  
Barrans, 749.  
Lyall and Campin, 759.  
Fuller, 768.  
Taylor, 809.  
Spencer, 848.  
Adams, 896.  
Lee, 1032.  
Salmon, 1067.  
Walker, 1102.  
Spencer, 1220 (*Supp.*)  
Evans, 1131.  
Scott, 1133.  
Statham and Collins, 1152.  
Harvey, 1173.

✓ Miscellaneous;

Butler, 14.  
Tredwell, 20.  
Tredwell, 24.  
Hatchett, 24.  
Miller, 104.  
Lacy, 212.  
Adams, 238.  
Weston, 294.  
Iremonger, 298.  
Du Maurier, 310.  
Fuller and Tabernacle, 434.  
Poole, 444.  
Webster, 451.  
Fuller and Knevitt, 473.  
Burch, 483.  
Bell, 501.  
Leverson, 506.  
Newton, 549.  
Fuller, 562.  
Briggs, 565.  
Adams, 566.  
Scott, 571.  
Speed, 595.  
Craig, 597.  
Hooper, G. N. and W., 609.  
Corbitt and Shaw, 616.  
Skelly, 712.  
Webster, 782.  
Holmes, 839.  
Gardiner, 854.  
Adams, 896.  
Parker, 945.  
Barker, 993.  
Scott, 1133.

Plate;

Mill, 6.  
Harrison, 15.  
Tredwell, 17.  
Tredwell, 19.  
Tredwell, 20.  
Pease, 23.  
Tredwell, 24.  
Reeves, 28.  
Moore, 49.  
Vulliamy, 69.

Springs—*cont.*Plate—*cont.*

Elliott, 162.  
 Houlditch, 111.  
 Manton, 162.  
 Wyke and Shorter, 164.  
 Koster, 166.  
 Poole, 235.  
 Barlow, 270.  
 Boulnois, 282.  
 Braby, 293.  
 McLellan, 308.  
 Prior, 318.  
 Adams and Buchanan, 322.  
 Buchanan, 335.  
 Wright, 340.  
 Walker, 366.  
 Wright, 379.  
 Adams, 405.  
 De Bergue and Haddan, 412.  
 Adams and Richardson, 414.  
 Horne, Beadon, and Smith, 416.  
 Mansell, 427.  
 Buckwell and Fisher, 442.  
 Rock, 446.  
 Webster, 476.  
 Newton, 500.  
 Warcup, 503.  
 Catterson, 520.  
 Parsons, 522.  
 Corlett, 530.  
 Briggs, 565.  
 Adams, 566.  
 Scott, 571.  
 Stocken, 588.  
 Scott, 588.  
 Holdway, 603.  
 Fox, 614.  
 Wright and Gorrery, 625.  
 Allan and Hunt, 627.  
 Hipkins and Britten, 631.  
 Emery, 641.  
 Wilson, 642.  
 Rishworth, 703.  
 Newton, 730.  
 Robertson, 731.  
 Hyde, 731.  
 Hadley, 732.  
 Spencer, 743.  
 Emery, 756.  
 Mickles (*Johnson*), 773.  
 Willcock (*Larned*), 787.  
 Emery, 790.  
 Gardiner, 793.  
 Leverson (*Brown*), 812.  
 Bettyes, 822.  
 Holmes, 839.  
 Henson, 847.  
 Watson, 862.  
 Wharton, 882.  
 Dodge, 894.  
 Adams, 896.  
 Bousfield (*Woodward*), 905.  
 Barnett, 923.  
 Holden, 976.

Springs—*cont.*Plate—*cont.*

Winby and Wharton, 1015.  
 Etienne, 1030.  
 Cary, 1038.  
 Salmon, 1067.  
 George, 1109.  
 Rock, 1118.  
 Rock, 1136.  
 Whitby, 1158.  
 Pneumatic;  
 Bramah, 139.  
 Barlow, 270. —  
 Poole, 319.  
 James, 357.  
 Spinks, 361.  
 Rayner, 384.  
 Walker and Mills, 388.  
 Hancock, 393.  
 Bell, 565. —  
 Macintosh, 588. —  
 Richardson and Richardson 706.  
 Lyall and Campin, 759.  
 Train, 803.  
 Statham and Collins, 1152.

Rolling bars for;  
 Thompson, 185.  
 Slagg, 209.  
 Smith, 339.  
 Marsden, 1079.

Setting and moulding;  
 Tredwell, 19. —

Substitute for:  
 Lyttle, 748.

Undescribed;  
 Knappe, 1.

Whalebone;  
 Hancock, 143.

Wood;  
 Paul and Hart, 180.  
 Graham, 246.  
 Bissell, 455. — *next*

## Starting vehicles:

Gresham, 873.  
 Johnson (*Wells*), 1065.  
 Bonneville (*D'Artenn*), 1094.

Steam carriages. *See also* Trac-  
tion engines:

Anderson, 653.  
 Anderson, 714.  
 Train (*Grice and Long*) 825.  
 Tomlinson, 1024.  
 Galloway, 1070.  
 Woodbury, 1112.

## Steering vehicles:

Halladay, 81.  
 Medhurst, 88.  
 Trevithick and Vivian, 96.

Steering vehicles—*cont.*

Roberts and Brine, 99.  
 Dumbell, 116.  
 Tindall, 150.  
 Baynes, 177.  
 Griffith, 184.  
 Dumbell, 189.  
 Burstall and Hill, 198.  
 Gurney, 201.  
 Hunter, 205.  
 Burstall and Hill, 210.  
 Viney and Pocock, 211.  
 Andrews, 212.  
 Neville, 213.  
 Burges, 215.  
 Gurney, 218.  
 Harland, 220.  
 Gough, 220.  
 Wright, 221.  
 Moore, 234.  
 Clive, 237.  
 Rawe and Boase, 237.  
 Hanson, 241.  
 Heaton, 243.  
 Bramley and Parker, 244.  
 Church, 250.  
 Gibbs and Chaplin, 252.  
 Roberts, 253.  
 James, 254.  
 Gibbs and Applegarth, 255.  
 Millichap, 266.  
 Bacon, 274.  
 Church, 275.  
 Carpmal, 279.  
 Peppercorne, 299.  
 Moat, 308.  
 Adams and Buchanan, 322.  
 Moat, 329.  
 Davies, 346.  
 Hills, 367.  
 Anderson, 396.  
 Wrigg, 402.  
 Morison, 419.  
 Farries, 420.  
 Price, 427.  
 Sager, 431.  
 Clarke and Motley, 433.  
 Anderson, 473.  
 Crestadoro, 474.  
 Schmoock, 544.  
 Konig, 551.  
 Nunn, 577.  
 Fowler, Burton, and Clarke, 666.  
 Wagstaff, 673.  
 Chaplin, 699.  
 Boydell, 710.  
 Scotson and Charnley, 721.  
 Giles, 727.  
 Fowler and Burton, 730.  
 Romaine, 735.  
 Burrell, 742.  
 Savage, 762.  
 Longstaff and Pullan, 771.  
 Lawrence, 779.  
 Pichler and Wigley, 786.  
 Stirling, 790.

Steering vehicles—*cont.*

Willcock (*Larned*), 787.  
 Aveling, 1196 (*Supp.*)  
 Taylor, 809.  
 Travis, 816.  
 Rickett, 819.  
 Daxley, 1202 (*Supp.*)  
 Austin, 1203 (*Supp.*)  
 Chellingworth and Thurlow, 835.  
 Hodson, 849.  
 Glatard, 856.  
 Hildebrand, 861.  
 Stevens (*Stevens*), 862.  
 Marsily, 866.  
 Simonton, 867.  
 Chellingworth and Thurlow, 868.  
 Hawksley, 876.  
 Lee and Taplin, 878.  
 Bray, 888.  
 Pullan and Lake, 889.  
 Barclay, 899.  
 Death, 917.  
 Leslie, 922.  
 Mackenzie and Smith, 927.  
 Orłowski, 936.  
 Faulds, 946.  
 Law and Downie, 950.  
 Barclay, 958.  
 Howard, Bousfield, and Tinney, 1210 (*Supp.*)  
 Goodman, 967.  
 Morel, 970.  
 Williams, 975.  
 Hodson, 979.  
 Clark and Batho, 1003.  
 Howard, Bousfield, and Tinney, 1214 (*Supp.*)  
 Morel, 1014.  
 Tomlinson, 1024.  
 Turner and Turner, 1034.  
 Henry (*Gellerat et Cie.*), 1050.  
 Craven and Fox, 1053.  
 Salmon, 1067.  
 Blanchet, 1218 (*Supp.*)  
 Du Boulay, 1068.  
 Galloway, 1070.  
 Henri (*Bernie and Desma-rest*), 1074.  
 Marvaud, 1079.  
 Mackenzie, 1080.  
 Lane, 1082.  
 Bruckshaw and Underhill, 1083.  
 Read, 1091.  
 Brooman (*Loubat*), 1100.  
 James, 1108.  
 Marvaud, 1111.  
 Bischoff, 1141.  
 Burrows and Burrows, 1156.  
 Clark, 1160.

## Steps :

Godsal, 40.  
 Moore, 46.

Steps—*cont.*

March, 68.  
 De Lolme, 73.  
 Thomason, 79.  
 Thomason, 83.  
 Newman, 181.  
 Woollams, 188.  
 Corbett, 202.  
 Gillett and Chapman, 291.  
 Benham, 319.  
 Hayman, 379.  
 Moor, 380.  
 Davies, 401.  
 Horne, Beadon, and Smith, 416.  
 Pownall, 437.  
 Rock, 446.  
 Gordon, 484.  
 Maude, 505.  
 Lilly, 513.  
 Gerner, 549.  
 Vezey, R. and E., 576.  
 Lenny, 599.  
 Abraham, 602.  
 Holdway, 603.  
 Davies, 659.  
 Curtis, 659.  
 Scott, 753.  
 Howells and Howells, 770.  
 Offord, 843.  
 Offord, 907.  
 Stocken, 913.  
 Christmas, 966.  
 Bonneville (*Sargent*), 967.  
 Leprovost, 968.  
 McDowell, 1022.  
 Wilson, 1029.  
 Etienne, 1030.  
 Grice, 1040.  
 Salmon, 1067.  
 Dobson, 1072.  
 Fuller, Fuller, and Martin, 1090.  
 Scott, 1133.  
 Morgan and Morgan, 1182.

Streaks for wheels. *See also*  
 Tires.

Baddeley, 8.  
 Parsous, 844.

Supports for carriages. *See also*  
*also* Overturning, preventing:

Gout, 62.  
 Pottinger, 94.  
 Lewis, 95.  
 Milton, 106.  
 Williams, 126.  
 White, 137.  
 Bush, 158.  
 Matthews, 171.  
 Woollams, 188.  
 Quetin, 230.  
 Williams, 242.

Supports for carriages—*cont.*

Aitken, 271.  
 Routledge and Galloway, 290.  
 Gaury, 341.  
 Boydell, 366.  
 Smith, 386.  
 Castelnaud, 995.  
 Warburton, 1115.  
 Cole, 1140.

Suspending vehicles. *See also*  
 Springs:

Greene, 4.  
 Jackson, 6.  
 Jackson, 7.  
 De la Chaumette, 8.  
 Reeves, 28.  
 Jacob, 31.  
 O'Keefe, 34.  
 Hatchett, 43.  
 Moore, 46.  
 Moore, 49.  
 Besant, 51.  
 Davis, 55.  
 Shankster, 56.  
 Hatchett, 58.  
 Besant, 64.  
 March, 68.  
 Willey, 84.  
 Medhurst, 88.  
 Reddell, 90.  
 Koster, 92.  
 Elliott, 102.  
 Houlditch, 111.  
 Williams, 115.  
 Cooper, 129.  
 Nicholson, 136.  
 Heffer, 140.  
 Banks, 160.  
 Manton, 162.  
 Matthews, 171.  
 Main, 178.  
 Griffith, 184.  
 Bewley, 191.  
 Gunn, 193.  
 Stafford, 197.  
 Hirst, W. and H., Heycock, and Wilkinson, 203.  
 Lacy, 212.  
 Neville, 213.  
 Winans, 227.  
 Quetin, 230.  
 Brown, 232.  
 Rawe and Boase, 237.  
 Hanson, 241.  
 Graham, 246.  
 Pearse, 247.  
 Whiteside, 269.  
 Hansom, 271.  
 Aitken, 271.  
 Bergin, 277.  
 Boulnois, 282.  
 Reinagle, 284.  
 Hurlock, 286.  
 Gillett and Chapman, 291.



Suspending vehicles—*cont.*

Iremonger, 298.  
 Du Maurier, 310.  
 Williams, 311.  
 Prior, 318.  
 Adams and Buchanan, 322.  
 Kollman, 324.  
 Moat, 329.  
 Maughan, 333.  
 Condie, 335.  
 Buchanan, 335.  
 Adams, 336.  
 Pape, 349.  
 Heale, 378.  
 Smith, 386.  
 Hunnybun and Venden,  
 390.  
 Pidding, 408.  
 Lowe and Simpson, 409.  
 Adams and Richardson, 414.  
 Mansell, 427.  
 Dunbar, 445.  
 Green, 472.  
 Walker, 477.  
 Newton, 478.  
 Smithson and Adam, 482.  
 Simon and Humphreys, 491.  
 Blackwell, 493.  
 Smith, 495.  
 Newton, 500.  
 Bell, 501.  
 Maude, 505.  
 Newton, 517.  
 Kesterton, 519.  
 Glover, 560.  
 Offord, 562.  
 Fuller, 562.  
 Townsend, 564.  
 Hazeldine, 570.  
 Abraham, 586.  
 Lenny, 594.  
 Swift, 604.  
 Lyall, 605.  
 Miller, 615.  
 Rock, 619.  
 Roberts, 620.  
 Scott, 626.  
 Allan and Hunt, 627.  
 Deacon, 638.  
 Lang, 644.  
 Maberly, 646.  
 Aldebert, 650.  
 Sanderson, 658.  
 Macpherson, 974.  
 Savage, 678.  
 Miller, 711.  
 Hadley, 732.  
 Oxley, 740.  
 Bray and Bray, 748.  
 Evans, 752.  
 Scott, 753.  
 Aimont, 755.  
 Fuller, 768.  
 Longstaff and Pullan, 771.  
 Juzet, 786.  
 Mannix, 846.  
 Simpson, 865.

Suspending vehicles—*cont.*

Dodge, 894.  
 Thirion, 912.  
 Wessely, 921.  
 Parker, 945.  
 Wycherley, 951.  
 Gorst, 956.  
 Nottingham, 991.  
 Tolhausen (*Badaul*), 993.  
 Etienne, 999.  
 McDowell, 1022.  
 Etienne, 1030.  
 Clark (*Duméry*), 1048.  
 Henry (*Gellerat and Cie*),  
 1050.  
 Adams, 1059.  
 George, 1109.  
 Friend, 1141.  
 Hadley, 1144.  
 Holliss, 1159.

Swingletrees. *See* Whipple-  
 trees and swingletrees.

## Tail boards :

Abraham, 602.  
 Parsons, 807.

## Telescopic vehicles :

Bush, 891.  
 Bush, 895.

Three-wheeled vehicles. *See*  
 Vehicles ; Velocipedes.

Tilts or covers for vehicles.  
*See* Covers, &c. ; Heads, &c.

## Timber carriages :

Horne, Beadon, and Smith,  
 416.

## Tipping-carts, &amp;c. :

Clay, 77.  
 Mason, 100.  
 Pope, 155.  
 Woollams, 188.  
 Cavaignac, 309.  
 Poole, 389.  
 Garn, 598.  
 Hughes (*Roy*), 870.  
 Gladstone, 900.  
 Brett, 1121.  
 Price, 1135.  
 Brierley, 1150.

## Tires :

Elastic ;  
 Thomson, 391.  
 Aitken, 398.  
 Dunlop, 470.  
 Allan, 471.  
 Davis, 508.  
 Fuller, 622.

Tires—*cont.*Elastic—*cont.*

Davis, 718.  
 Lyall and Campin, 759.  
 Davis, 764.  
 Offord, 827.  
 Parfrey, 863.  
 Chellingworth, and Thurlow, 868.  
 Richards, 974.  
 Sievier, 1046.  
 Morton (*Morton*), 1180.

## Fastening;

Jordan and Swinton, 39.  
 Brodie, 54.  
 Redmund, 261.  
 Curtis, 305.  
 Phipps, 342.  
 Smith, 389.  
 Exall, 403.  
 Maberly, Branwhite, and Lusher, 404.  
 Adams and Richardson, 414.  
 Evans, 422.  
 Ashbury, 424.  
 Mansell, 427.  
 Olive, J. and W., 597.  
 Krupp, 601.  
 Fuller, 622.  
 Thomas, 812.  
 Fenton, 830.  
 Thomas, 840.  
 Evans, 845.  
 Krupp, 849.  
 Wright, 857.  
 Stableford, 879.  
 Juhel (*Rives*), 910.  
 Adams, 1001.  
 Ashe (*Ashe*), 1033.  
 Wright, 1086.  
 Hancock, 1117.  
 Russell, 1137.  
 Winby and Winby, 1138.  
 Collins, 1171.

## Flanges (moveable) of;

Hill, 199.  
 Lloyd, 941.

## Making by machinery;

Palin, 4.  
 Blockley, 18.  
 Bourne and Bartley, 306.  
 Bodmer, 317.  
 Bodmer, 363.  
 Saunders, 372.  
 Exall, 403.  
 Cowper, 438.  
 Christie, 440.  
 Brooman, 464.  
 Dodds, 492.  
 Saunders, 504.  
 Bothams, 512.  
 Dubs, 514.  
 Johnson (*Jackson Bros. & Petin, Gaudet, and Co.*), 577.

Tires—*cont.*Making by machinery—*cont.*

Johnson (*Jackson Bros. & Petin, Gaudet, and Co.*), 590.  
 Johnson (*Jackson Bros. & Petin, Gaudet, and Co.*), 598.  
 Krupp, 601.  
 Brooman (*Duboy*), 625.  
 Bartholomew and Heptinstall, 661.  
 Danvers and Billings, 670.  
 Jackson, 680.  
 Brignon, 695.  
 Moss, Gamble and Gamble 697.  
 Bessemer, 745.  
 Plum, 791.  
 Wilson and North, 791.  
 Carmont and Corbett, 802.  
 Stocker, 831.  
 Brooman (*Soc. des forges de Montataire*), 840.  
 Spencer and Spencer, 852.  
 Stocker and Stocker, 871.  
 Allott and Thelwall, 875.  
 Bartholomew and Heptinstall, 903.  
 Longridge, 944.  
 Plum, 1005.  
 Brooman (*Lamur*), 1032.  
 Holiday, 1076.  
 Hancock, 1117.  
 Preventing wear of;  
 Riley, 224.  
 Hynes, 272.  
 Jessop, 348.  
 Jackson, 376.  
 Christie, 440.  
 Samuelson, 735.  
 Putting on to wheels;  
 Gedge (*Imhoff*), 973.  
 Roughing;  
 Trevithick and Vivian, 96.  
 Neville, 213.  
 Streaks used instead of tires  
 Baddeley, 8.  
 Parsons, 844.  
 Undulatory;  
 Etienne, 999.  
 Etienne, 1050.  
 Bruckshaw and Underhill, 1083.  
 Various;  
 Thornhill, 10.  
 Matthews, 41.  
 Brodie, 54.  
 Brandling, 198.  
 Meaden, 219.  
 Reinagle, 284.  
 Horne, Beadon, and Smith, 416.  
 Campbell 434.

Tires—*cont.*Various—*cont.*

Davis, 469.  
 Wilson, 483.  
 Dubs, 514.  
 Dicks, 519.  
 Holmes, 572.  
 Skelley, 579.  
 Johnson (*Geoffrey*), 582.  
 Davies, 629.  
 Downing, 633.  
 Wallace, 635.  
 Brennand, 742.  
 Apperly and Clissold, 769.  
 Barclay, 899.  
 Juhel (*Rives*), 910.  
 Marchal and de Wiart, 912.  
 Salmon, 1067.  
 Gore, 1171.

With moveable segments for soft ground ;  
 Hazeldine, 570.

With spuds or holding teeth or bars ;

Bray, 645.  
 Wagstaff, 673.  
 Chaplin, 699.  
 Romaine, 735.  
 Taylor, 741.  
 Barrans, 749.  
 Dorman and Cowper, 765.  
 Longstaff and Pullan, 771.  
 Stirling, 790.  
 Austin, 1198 (*Supp.*)  
 Peacock and Truman, 817.  
 Austin, 1203 (*Supp.*)  
 Chellingworth and Thurlow, 868.  
 Pensam, 874.  
 Lee, 886.  
 Pullan and Lake, 889.  
 Selby, 890.  
 Lee, 913.  
 Aveling, 947.  
 Keene (*Richards*), 1101.  
 James, 1108.

Towing on canals, carriage for :

Davies, 346.

Trace attachments :

Moore, 46.

Traction engine, carriage to be drawn by :

Marshall, 881.

Traction engines :

Blackburn and Blackburn, 1193 (*Supp.*)  
 Wagstaffe, 673.  
 Chaplin, 699.  
 Boydell, 710.  
 Giles, 727.

Traction engines—*cont.*

Fowler and Burton, 730.  
 Romanie, 735.  
 Taylor, 741.  
 Burrell, 743.  
 Bray and Bray, 748.  
 Barrans, 749.  
 Boydell, 757.  
 Savage, 762.  
 Dorman and Cowper, 765.  
 Blackburn and Blackburn, 1195 (*Supp.*)  
 Longstaff and Pullan, 771.  
 Burness, 1196 (*Supp.*)  
 Willcock (*Larned*), 787.  
 Stirling, 790.  
 Giles, 794.  
 Taylor, 798.  
 Dorning, 1196 (*Supp.*)  
 Clayton and Shuttleworth, 1197 (*Supp.*)  
 Paterson, 1197 (*Supp.*)  
 Austin, 1198 (*Supp.*)  
 Taylor, 809.  
 Travis, 816.  
 Rickett, 819.  
 Daxley, 1202 (*Supp.*)  
 Austin, 1203 (*Supp.*)  
 Chellingworth and Thurlow, 835.  
 Stevens (*Stevens*), 862.  
 Lee and Taplin, 864.  
 Simonton, 867.  
 Chellingworth and Thurlow, 868.  
 Lee and Taplin, 878.  
 Marshall, 881.  
 Gilbert, 1205 (*Supp.*)  
 Bray, 888.  
 Yarrow and Hilditch, 1206 (*Supp.*)  
 Pullan and Lake, 889.  
 Lee, 1207 (*Supp.*)  
 Barclay, 899.  
 Fowler, 911.  
 Lee, 913.  
 Holland, 917.  
 Death, 917.  
 Barclay, 1208 (*Supp.*)  
 Lee and Lee, 931.  
 Faulds, 946.  
 Law and Downie, 950.  
 Barclay, 958.  
 Howard, Bousfield, and Tinney, 1210 (*Supp.*)  
 Blackburn, 1211 (*Supp.*)  
 Morel, 970.  
 Hornsby, Bonnell, and Astbury, 975.  
 Webb, 1212 (*Supp.*)  
 Clark and Batho, 1003.  
 Morel, 1014.  
 Roberts, 1015.  
 Cope, 1018.  
 Fowler and Webb, 1215 (*Supp.*)

Traction engines—*cont.*

- Lee, 1032.  
 Clark (*Blanchet*), 1215  
     (*Supp.*)  
 Payne, 1039.  
 Henry (*Gellerat & Cie.*),  
     1050.  
 Blanchet, 1218 (*Supp.*)  
 Henry (*Bernie and Des-*  
     *marest*), 1074.  
 Mackenzie, 1080.  
 Brooman (*Loubat*), 1100.  
 Keene (*Richards*), 1101.  
 Bischoff, 1141.  
 Burrows and Burrows, 1156.  
 Clark, 1160.  
 Appleby, 1162.  
 Phillips-Smith, 1165.  
 Brooman (*Chauveau and*  
     *De Carfort*), 1220 (*Supp.*)

Tram cars, &c. *See* Vehicles  
 (for tramroads, for tram  
 and common roads).

## Trucks for casks, sacks, &amp;c.

- Wright, 209.  
 Burton, 520.  
 Dowling, 559.  
 Beaumont, 1049.  
 Lamplugh, 1063.

Turntable for turning traction  
engines :

- Romaine, 735.

Two wheeled vehicles. *See*  
 Vehicles ; Velocipedes.

Umbrella stands for car-  
riages :

- Tyerman, 614.  
 Gilks, 643.  
 Etienne, 1030.

Umbrella supports for car-  
riages :

- Bull, 38.

## Umbrellas for carriages :

- Davies, 450.

Under carriages. *See* Perches ;  
 Suspending vehicles.

Unloading, vehicles with  
special arrangements for :

- Van Daalen, 5.  
 Clay, 77.  
 Mason, 100.  
 Bosworth, 124.  
 Pope, 155.  
 Woollams, 188.  
 Brandreth, 206.

Unloading, &c.—*cont.*

- Wright, 209.  
 Adams, 288.  
 Cavaignac, 309.  
 Poole, 389.  
 Powell, 390.  
 Adams and Richardson, 414.  
 Horne, Beadon, and Smith,  
     416.  
 Garn, 598.  
 Hughes (*Roy*), 870.  
 Gladstone, 900.  
 Brett, 1121.  
 Price, 1135.  
 Gedge (*Massé*), 1138.  
 Brierley, 1150.

## Urinal for vehicles :

- Davies, 450.

## Vehicles :

- Double storeyed ;  
 Snowden, 196.  
 Hadley, 732.  
 Bray, 959.  
 Salmon, 1067.  
 Four wheeled ;  
 Hill, 3.  
 Tull, 12.  
 O'Keefe, 21.  
 Moore, 46.  
 Overend, 80.  
 Mason, 100.  
 Wyke and Shorter, 164.  
 Koster, 166.  
 Matthews, 171  
 Wall, 176.  
 Newman, 180.  
 Hill, 199.  
 Josephs, 225.  
 Reinagle, 284  
 Adams, 288.  
 Routledge and Galloway, 210.  
 Moat, 309.  
 Richardson, 327  
 Warburton, 356.  
 Franklinsky, 448.  
 Newton, 478.  
 Newton, 517.  
 Thomson, 593.  
 White, 776.  
 Newton (*Singer*),  
 Lawrence, 779.  
 Wright (*De St. Marc*), 781.  
 Ward, 964.  
 Apps, 977.  
 Barker, 993.  
 Day, 1175.  
 One wheeled ;  
 Greene, 4.  
 Thomson, 13.  
 Main, 178.  
 Quetin, 230.  
 Allen, 585.  
 Shakespear, 682.  
 Telescopic ;  
 Bush, 891.  
 Bush, 895.

# Vehicles—cont.

Three wheeled ;  
 Savile, 4.  
 Bewley, 191.  
 Higgins, 222.  
 Aitken, 271.  
 Braby, 293.  
 Pape, 349.  
 Wilkey, 359.  
 Metcalfe, 385.  
 Newton, 478.  
 Newton, 500.  
 Newton, 517.  
 Scott, 571.  
 Scott, 588.  
 Lyall, 605.  
 Durant, 654.  
 Richardson and Richard-  
 son, 706.  
 Etienne, 999.  
 Walter, 1004.  
 Etienne, 1030.  
 Brierley, 1150.

Tram and common road ;  
 Hill, 199.  
 Kettle and Prosser, 370.  
 Curtis, 625.  
 Newton (*Castor*), 820.  
 Train (*Musgrove*), 824.  
 Train (*Grice and Long*),  
 825.  
 Greaves, 829.  
 Bath, 948.  
 Elsdon, 986.

Tramroad ;  
 Easton, 204.  
 Adams and Richardson, 414.  
 Train, 803.  
 Johnson (*Wharton*), 1199  
 (*Supp.*)  
 Bigelow (*Harris*), 836.  
 Prentis, 1201 (*Supp.*)  
 Hathaway, 1202 (*Supp.*)  
 Fox, 1202 (*Supp.*)  
 Arrowsmith, 1204 (*Supp.*)  
 Adams, 866.  
 Adams, 1205 (*Supp.*)  
 Bush, 891.  
 Bush, 895.  
 Ward, 1216 (*Supp.*)  
 Eastman, 1218 (*Supp.*)  
 Woodbury, 1112.

Two wheeled ;  
 Hill, 3.  
 Chapman, 10.  
 Tull, 12.  
 Crispe, 12.  
 Moore, 49.  
 Vulliamy, 69.  
 Koster, 166.  
 Banks, 168.  
 Johnson, 173.  
 Woollams, 188.  
 Hansom, 271.  
 Poole, 286.  
 Adams, 288.

# Vehicles—cont.

Two wheeled—cont.  
 Routledge and Galloway, 290.  
 Braby, 293.  
 Weston, 294.  
 Hayman, 295.  
 Williams, 311.  
 Adams and Buchanan, 322.  
 Maughan, 333.  
 Harvey, 370.  
 Smith, 386.  
 Lyall, 453.  
 Walker, 477.  
 Newton, 478.  
 Hedges, 480.  
 Bird, 499.  
 Newton, 500.  
 Lilly, 513.  
 Newton, 517.  
 Kesterton, 519.  
 Parfitt, 522.  
 Roberts, 539.  
 Glover, 541.  
 Surgey, 563.  
 Abraham, 586.  
 Lenny, 594.  
 Abraham, 602.  
 Lyall, 605.  
 Young, 620.  
 Hardacre, 623.  
 Portus, 629.  
 Williams, 650.  
 Sanderson, 653.  
 Oxley, 740.  
 Evans, 752.  
 Steward, 838.  
 Simpson, 865.  
 Cooke, 885.  
 Rimmer, 939.  
 Nottingham, 961.  
 Nottingham, 991.  
 Castelnau, 995.  
 Durant and Gore, 1019.  
 Wilson, 1029.  
 Etienne, 1030.  
 Steevens, 1035.  
 Harrington, 1098.  
 Cole, 1140.  
 Friend, 1141.  
 Botwood, 1153.  
 Gore, 1171.  
 Harvey, 1173.  
 Ockerby, 1174.

Various ;  
 Claggett, 36.  
 Besant, 64.  
 Brown, 232.  
 Day, 538.  
 Dameron, 573.  
 Dameron, 587.  
 Lenny, 599.  
 Hadley, 732.  
 White, 776.  
 Ward, 964.  
 Symes, 1017.  
 Adams, 1059.  
 Cheffins, 1108.

Vehicles—*cont.*

With living or sleeping accommodation ;

Besant, 64.  
 Edwards, 488.  
 O'Leary, 493.  
 Snelling, 494.  
 Day, 538.  
 Esnouf, Mauger, and Lewis, 538.  
 Christie, 576.  
 Allen, 585.  
 Beaumont, 596.  
 Newton (*Singer*), 776.  
 Salmon, 1067.

## Velocipedes :

Johnson, 173.  
 Metcalfe, 385.  
 Davies, 450.  
 Parker, 614.  
 Poulson, 843.  
 Marsily, 866.  
 Thirion, 912.  
 Mackenzie and Smith, 927  
 Edge, 933.  
 Goodman, 967.  
 Du Boulay, 1068.  
 Gilman, 1165.

## Velocity, accelerating :

Doncaster, 152.

## Ventilating carriages :

Reddell, 90.  
 Collins, 105.  
 Poole, 286.  
 Hazard, 355.  
 Warburton, 356.  
 Mellish, 454.  
 Heppburn, 454.  
 Scott, 455.  
 Wheatley, 459.  
 Green, 472.  
 Wilson, 483.  
 Palmer, 515.  
 Johnson (*Chilcott and Palmer*), 527.  
 Miller, 615.  
 Roberts, 620.  
 Cooke, 648.  
 Wheelhouse and Greenwood, 665.  
 Gourley, 687.  
 Hadley, 732.  
 Cooke, 885.  
 Minchin, 886.  
 Wigzell, 891.  
 Woodall, 902.  
 Flexen, 929.  
 Hilliar, 942.  
 Hilliar, 943.

## Vibration, preventing :

Taylor, 394.  
 Adams and Richardson, 414.  
 Horne, Beadon, and Smith, 416.  
 Davis, 469.  
 Oates, 475.  
 Longbottom, 477.  
 Wilson, 558.  
 Scott, 588.  
 Haines, 605.  
 Davies, 629.  
 Brooman, 632.  
 Aldebert, 650.  
 Durant, 654.  
 Oxley, 716.  
 Scott, 753.  
 Seton, 785.  
 Morgan, 841.  
 Offord, 843.  
 Marchal and De Wiart, 912.  
 Rimmer, 939.  
 Parker, 945.  
 Cook, 985.  
 Melling, 1021.  
 Macdonald, 1052.  
 Brooman (*Loubat*), 1100.  
 George, 1109.  
 Scott, 1133.  
 Hollis, 1159.  
 Ockerby, 1174.

## Waggon forming two carts .

Mason, 100.

Waggons. *See* Vehicles.

## Warming carriages :

Reddell, 90.  
 Violette, 369.  
 Adams and Richardson, 414.  
 Davis, 469.  
 Johnson (*Chilcott and Palmer*), 527.  
 Preux, 628.  
 Hutton, 640.  
 Newton (*Seely*), 835.  
 Mackenzie, 1080.

Washers for axles. *See also*  
 Axleboxes :

Broad, 651.  
 Offord, 843.

Washing windows, panels,  
 &c. :

Newton (*Farnsworth and Farnsworth*), 926.

## Waterclosets for carriages :

Newton (*Singer*), 776.  
 La Mothe, 882.  
 Leprovost, 968.

**Waterproofing covers and tilts:**

Eyres, Mowate, and Walles, 2.  
 Rimmel, 557.  
 Coignet, 575.  
 Hodges, 648.  
 De Clerville, 669.  
 De Brun, 717.

**Weighing, vehicles arranged for:**

Dowling, 559.  
 Newton, 710.  
 Johnson (*Dubreuil and Dubreuil*), 924.  
 Dubreuil, 963.

**Whalebone applied to construction of vehicles:**

Hancock, 143.

**Wheelbarrows:**

Van Berg, 2.  
 Mallet, 238.  
 O'Leary, 493.  
 Wilson, 497.  
 Underwood, 520.  
 Metcalfe, 556.  
 Reinagle, 590.  
 De Prades, 616.  
 Andraud, 633.  
 Hughes (*Roy*), 870.  
 Stephens, 1117.  
 Brett, 1121.  
 Price, 1135.

**Wheels. See also Tires:****Additional, for carriages:**

Barlow, 8.  
 Godfrey, 78.  
 Gordon, 183.  
 Brandreth, 206.  
 Clive, 237.  
 Harsleben, 281.  
 Varley, 339.  
 Longstaff and Pullan, 771.  
 Pullan and Lake, 889.

**Antifriction:**

Whitcher, Pickford, and Whitbourn, 187.  
 Hansom, 271.  
 James, 357.  
 Beaumont, 536.  
 Miller, 429.  
 Ashwell, 774.

**Castor:**

Overend, 80.  
 Pape, 349.  
 Goupil, 1208 (*Supp.*)

**Changeable:**

Chapman, 10.  
 Taylor, 798.

**Wheels—cont.****Conical:**

De Cristoforis, 686.

**Elastic:**

Butler, 32.  
 Newcome, 38.  
 Isaacs, 192.  
 Bramley and Parker, 244.  
 Church, 250.  
 Whiteside, 269.  
 Adams, 274.  
 Harsleben, 281.  
 Reinagle, 284.  
 Weston, 294.  
 Grime, 300.  
 Adams, 336.  
 Pape, 349.  
 Thomson, 391.  
 Adams, 405.  
 Miller, 429.  
 Newton, 443.  
 Scott, 457.  
 Hodge, 458.  
 Davis, 469.  
 Allan, 471.  
 Hodges, 541.  
 Adams, 558.  
 Scott, 571.  
 Goodyear, 58.  
 Scott, 588.  
 Scott, 626.  
 Hees, 634.  
 Richardson and Richardson, 706.  
 Maissiat, 728.  
 Hadley, 732.  
 Taylor, 741.  
 Main, 758.  
 Davis, 764.  
 Newton (*Crane*), 783.  
 Mathers, 795.  
 Mannix, 318.  
 Marsily, 866.  
 Adams, 1205 (*Supp.*)  
 Adams, 896.  
 Offord, 907.  
 Oxley, 915.  
 Mayes, 926.  
 Newton (*Woodbury*), 955.  
 Richards, 974.  
 Markham (*McIvor*), 1074.  
 Scott, 1133.

**Felloes:**

Jacob, 29.  
 Jacob, 40.  
 Hatchett, 43.  
 Bramah, 139.  
 Koster, 166.  
 Gunn, 193.  
 Gibbs and Applegath, 254.  
 Redmund, 261.  
 Parkin, 314.  
 Dodds and Owen, 324.  
 Pape, 349.  
 Croskill, 377.  
 Wilson, 385.  
 Aitkin, 398.

Wheels—*cont.*Felloes—*cont.*

Exall, 403.  
 Newton, 478.  
 Newton, 496.  
 De Bode, 514.  
 Newton, 542.  
 Jackson, 551.  
 Pattinson, 566.  
 Scott, 571.  
 Allen, 585.  
 Scott, 588.  
 Wallace, 635.  
 Worssam and Grist, 639.  
 Brooman, 649.  
 Maissiat, 728.  
 Johnson (*Gibson*), 833.  
 Parsons, 844.  
 Edwards, 848.  
 Oxley, 915.  
 Richards, 974.  
 Jacobs, 1081.  
 Rowe, 1119.

## Forging;

Newton, 554.  
 De Fontainemoreau (*De-  
 fassieux and Peillon*),  
 558.  
 Johnson (*Petin and Gau-  
 det*), 561.

## For road and tram;

Curtis, 305.  
 Parkin, 314.  
 Johnston, 352.  
 Crosskill, 530.  
 Anderson, 1194 (*Supp.*)  
 Main, 758.  
 Taylor, 798.  
 Bath, 807.  
 Samuel and Train, 815.  
 Shepard, 1204 (*Supp.*)  
 Adams, 1205 (*Supp.*)  
 Selby, 890.  
 Lloyd, 941.  
 Myers, 1219 (*Supp.*)  
 Brooman (*Loubat*), 1100.  
 Johnston and Rennie, 1146.

## Guards for;

Turrill, 158.  
 Ward, 611.  
 Maberly, 646.  
 Shoner, 691.  
 Beattie, 709.  
 Taylor, 798.  
 Newton (*Castor*), 820.  
 Lee, 1032.

## Guide;

Cayley, 1187 (*Supp.*)  
 Johnston, 352.  
 Kettle and Prosser, 370.  
 Prosser, 382.  
 Curtis, 625.  
 Lawrence, 779.  
 Greaves, 829.  
 Bath, 948.

Wheels—*cont.*

Horizontal friction or holding;  
 Donovan and O'Brien, 1091.

## Making wooden;

Gibbs and Applegath, 254.  
 Crosskill, 377.  
 Exall, 403.  
 De Bode, 514.  
 Oxley, 568.  
 Thonet, 804.  
 Johnson (*Gibson*), 833.  
 Carpenter, 872.  
 Oxley, 915.  
 Russell, 1137.

## Metal;

Newcome, 38.  
 Jordan and Swinton, 39.  
 Hawks, 114.  
 Brown, 133.  
 Rogers, 140.  
 Banks, 160.  
 Seaton, 204.  
 Mallet, 238.  
 Forrester, 250.  
 Redmund, 261.  
 Tigar, 265.  
 Hick, 268.  
 Ingledew, 276.  
 Day, 278.  
 Hague, 296.  
 Cottam, 299.  
 Grime, 300.  
 Bounce and Bartley, 306.  
 Adams and Buchanan, 322.  
 Dodds and Owen, 324.  
 Phipps, 342.  
 Slaughter, 348.  
 Palmer, 349.  
 Hills, 367.  
 Wilson, 385.  
 Heath, 397.  
 Eddy, 402.  
 Smith, 410.  
 Evans, 422.  
 Mansell, 427.  
 Wharton, 432.  
 Chambers, 437.  
 Cowper, 438.  
 Christie, 440.  
 Dodds, 492.  
 Eades, 503.  
 Davis, 508.  
 De Montferrier, 523.  
 Johnson (*Petin and Gau-  
 det*), 530.  
 Jackson, 551.  
 Marshall, 553.  
 Pattinson, 566.  
 Rye, 577.  
 Fabien, 579.  
 Olive, J. and W., 597.  
 Krupp, 601.  
 Gedge (*Charpentier*), 608.  
 Downing, 633.  
 Hees, 634.  
 Maw, 709.  
 Capstick, 723.



Wheels—*cont.*

Metal—*cont.*

Rowan, 725.  
 Samuelson, 735.  
 Burrell, 742.  
 Bessemer, 745.  
 Newton (*Brown*), 805.  
 De Buyer, 805.  
 Taylor, 809.  
 Offord, 827.  
 Parsons, 828.  
 Evans, 845.  
 Wright, 857.  
 Lockie, 883.  
 Lee, 886.  
 Offord, 907.  
 Day (*Lischine and Handy-side*), 1036.  
 Winby and Winby, 1138.  
 Burrows and Burrows, 1156.

Multi-tired ;

Brandling, 198.  
 Curtis, 305.  
 Crosskill, 530.  
 Barrans, 749.  
 Elsdon, 986.

Naves ;

Taylor, 35.  
 Newcome, 38.  
 Ducrest, 60.  
 Dodson and Skidmore, 85.  
 Turner, 86.  
 Lockett, 87.  
 Bauer, 97.  
 Miller, 104.  
 Cabanel, 112.  
 Paton, 117.  
 Flight, 119.  
 Bramah, 120.  
 Randolph, 121.  
 Wheatley, 127.  
 Cooper, 129.  
 Brown, 133.  
 Rogers, 140.  
 Wilks, 142.  
 Hancock, 143.  
 Barclay and Cuming, 147.  
 Whitfield, 148.  
 Milton, 157.  
 Burnett, 161.  
 Koster, 166.  
 Seaton, 204.  
 Jones, 211.  
 Pearse, 239.  
 Redmund, 261.  
 Gibbs, 268.  
 Hynes, 272.  
 Weston, 294.  
 Bourne and Bartley, 306.  
 Dodds and Owen, 324.  
 Slaughter, 348.  
 Lee, 353.  
 Parby, 373.  
 Wilson, 385.  
 Aitken, 398.

Wheels—*cont.*

Naves—*cont.*

Exall, 403.  
 Maberly, Branwhite, and Lusher, 404.  
 Stratton, 412.  
 Miller, 429.  
 Pidding, 460.  
 Newton, 465.  
 Davis, 469.  
 Begbie, 495.  
 Smith and Parfrey, 503.  
 Jackson, 551.  
 Coulson, 558.  
 Scott, 571.  
 Allen, 585.  
 Scott, 588.  
 Krupp, 601.  
 Hardacre, 623.  
 Scott, 626.  
 Downing, 633.  
 Wallace, 635.  
 Lang, 644.  
 Brooman, 649.  
 Bousfield, 666.  
 Munro, 678.  
 Craig, 685.  
 Heyns, 708.  
 Maw, 709.  
 Capstick, 723.  
 Rowan, 725.  
 Luis, 727.  
 Maissiat, 728.  
 Hadley, 732.  
 Samuelson, 735.  
 Braby and Braby, 737.  
 Russell, 768.  
 Mathers, 795.  
 Brooman (*Hamoir*), 799.  
 Thonet, 804.  
 Parsons, 828.  
 Brooman (*Bertrand*), 832.  
 Parsons, 844.  
 Evans, 845.  
 Wright, 857.  
 Marsily, 866.  
 Stableford, 879.  
 Lockie, 883.  
 Offord, 907.  
 Gray, 919.  
 Thomas, 919.  
 Wessely, 921.  
 Haseltine (*Leavitt*), 923.  
 Mayes, 926.  
 Uphill, Morton, and Asbury, 927.  
 Goodman, 967.  
 Rodgers, 1009.  
 Morel, 1014.  
 Melling, 1021.  
 Brooman (*Frainet*), 1023.  
 Day (*Lischine and Handy-side*), 1036.  
 Swift, 1041.  
 Wright, 1086.  
 Sovereign, 1124.  
 Gore, 1171.

Wheels—*cont.*

- Preventing breakage of;
  - Dunning, 9.
- Removing dirt from;
  - Brandling, 198.
  - Bower, 489.
  - Fontenau, 553.
  - Shoner, 691.
  - Chapman, 1007.
  - Hart, 1160.
- Securing;
  - Willey, 72.
  - Edgell, 76.
  - Roberts and Brine, 99.
  - Taylor, 131.
  - Brown, 133.
  - Bellingham, 138.
  - Hancock, 143.
  - Spratley, 145.
  - Barclay and Cuming, 147.
  - Hopkinson, 170.
  - Matthews, 171.
  - Hanson, 241.
  - Bramley and Parker, 244.
  - Day, 278.
  - Mason, 279.
  - Poole, 316.
  - Wright, 340.
  - Millichap, 382.
  - Chinnoek, 489.
  - Brooman, 581.
  - Johnson (*Geoffroy*), 582.
  - Dimpfel (*Goddard*), 628.
  - Downing, 633.
  - Capstick, 723.
  - Smith, 727.
  - Lyall and Campin, 759.
  - Brooman (*Masson*), 763.
  - Mathers, 795.
  - Partridge, 812.
  - Parsons, 828.
  - Brooman (*Bertrand*), 832.
  - Watkins, 856.
  - Bray, 888.
  - Clarke, 901.
  - Johnson (*Bathias*), 904.
  - Upfill, Morton, and Asbury, 927.
  - McClintock, 942.
  - Hughes (*Jucket*), 973.
  - Asbury, 979.
  - Lee, 1032.
  - Glover, 1044.
  - Siever, 1046.
  - Lloyd, 1069.
  - Wright, 1086.
  - Wright, 1097.
  - Sovereign, 1124.
  - Russell, 1137.
  - Richards and Grindle, 1167.
- Spokes;
  - Taylor, 35.
  - Newcome, 38.
  - Jacob, 40.
  - Ducrest, 60.
  - Bauer, 97.

Wheels—*cont.*

- Spokes—*cont.*
  - Miller, 104.
  - Paton, 117.
  - Bramah, 120.
  - Bramah, 139.
  - Rogers, 140.
  - Hancock, 143.
  - Barclay and Cuming, 147.
  - Whitfield, 148.
  - Milton, 157.
  - Seaton, 204.
  - Jones, 211.
  - Howard, 236.
  - Pearse, 239.
  - Bramley and Parker, 244.
  - Gibbs and Applegarth, 254.
  - Redmund, 261.
  - Tigar, 265.
  - Gibbs, 268.
  - Inglelew, 276.
  - Harsleben, 281.
  - Reinagle, 284.
  - Pearse, 296.
  - Bourne and Bartley, 306.
  - Dodds and Owen, 324.
  - Wright, 340.
  - Pape, 349.
  - Parlby, 373.
  - Atkinson, 376.
  - Smith, 410.
  - Stratton, 412.
  - Evans, 422.
  - Miller, 429.
  - Campbell, 434.
  - Pidding, 460.
  - Davis, 469.
  - Allan, 471.
  - Scott, 486.
  - Dodds, 492.
  - Begbie, 495.
  - Dicks, 519.
  - Corrall, 540.
  - Jackson, 551.
  - Skelley, 579.
  - Allen, 585.
  - Scott, 588.
  - Hughes, 600.
  - Hardacre, 623.
  - Scott, 626.
  - Wallace, 635.
  - Worssam and Grist, 639.
  - Brooman, 649.
  - Beaumisnil and Erhard, 655.
  - Bousfield, 666.
  - Maw, 709.
  - Beale, 713.
  - Rowan, 725.
  - Maissiat, 728.
  - Samuelson, 735.
  - Collier and Noble, 744.
  - Mathers, 795.
  - Thonet, 804.
  - Parsons, 828.
  - Hughes, 831.
  - Smith and Taylor, 869.
  - Lockie, 883.

Wheels—*cont.*

Spokes—*cont.*

Offord, 907.  
Haseltine (*Leavitt*), 923.  
Wilson, 957.  
Goodman, 967.  
Richards, 974.  
Rodgers, 1009.  
Melling, 1021.  
Brooman (*Frainet*), 1023.  
Hancock, 1117.  
Rowe, 1119.

Spoke shoes:

Howard, 236.  
Richards, 974.  
Brooman (*Frainet*), 1023.

Spokes, substitutes for;

Hick, 268.  
Adams, 274.  
Reinagle, 284.  
Adams, 336.  
Slaughter, 348.  
Palmer, 349.  
Eddy, 403.  
Taylor, 413.  
Newton, 478.  
Newton, 500.  
Newton, 517.  
Newton, 517.  
Hodges, 541.  
Beaumisnil and Erhard, 655.  
Heyns, 708.  
Parsons, 844.  
Evans, 845.  
Wright, 857.  
Stableford, 879.  
Winby and Winby, 1138.

Streaks;

Baddeley, 8.  
Parsons, 844.

Strengthening;

Ladd, 14.  
Pearse, 297.

Substitutes for, such as rollers, spheres, legs, &c.;

Edisbury, 5.  
German, 93.  
Dumbell, 116.  
Palmer, 137.  
Brunton, 142.  
Gompertz, 150.  
Reynolds, 157.  
Baynes, 177.  
Dumbell, 189.  
Gordon, 195.  
Gurney, 201.  
Crabtree, 228.  
Clark, 312.  
Nicolas, 327.  
Davies, 346.  
Beaumont, 386.  
Beadon, 388.  
Pidding, 408.  
Sager, 431.

Wheels—*cont.*

Substitutes for, such as rollers, spheres, legs, &c.—*cont.*

Giles, 727.  
Brennand, 761.  
Taylor, 798.  
Hodson, 849.  
Paraire, 858.  
Stevens (*Stevens*), 862.  
Brooman (*De Maklakoff*), 903.  
Molyneux, 933.  
Henry (*Bernie and Desmarest*), 1074.

Tires of. *See* Tires.

Toothed;

Lindsay, 201.  
Easton, 204.  
Pullan and Lake, 889.

Wood and iron combined;

Thornhill, 19.  
Taylor, 35.  
Randolph, 121.  
Bramah, 139.  
Koster, 166.  
Snowden, 196.  
Hill, 199.  
Neville, 213.  
Bentley, 215.  
Burgess, 215.  
Pearse, 239.  
Roberts, 253.  
Mason, 279.  
Curtis, 305.  
Parkin, 314.  
Adams and Buchanan, 322.  
Hills, 331.  
Dircks, 331.  
Parlby, 373.  
Atkinson, 376.  
Poole, 381.  
Smith, 386.  
Smith, 410.  
Taylor, 413.  
Ashbury, 424.  
Mansell, 427.  
Wharton, 432.  
Marshall, 470.  
Scott, 486.  
Dodds, 492.  
Skelley, 579.  
Heyns, 630.  
Wallace, 635.  
Heyns, 708.  
Capstick, 723.  
Braby and Braby, 737.  
Ransley, 766.  
Longstaff and Pullan, 771.  
Parsons, 778.  
Stirling, 790.  
Mathers, 795.  
Offord, 827.  
Hughes, 831.  
Parsons, 844.  
Chellingworth and Thurlow, 868.

Wheels—*cont.*Wood and iron combined—*cont.*

Stableford, 873.  
 Offord, 907.  
 Gray, 919.  
 Rodgers, 1009.  
 Melling, 1021.  
 Brooman (*Frainet*), 1023.  
 Salmon, 1067.  
 Keene (*Richards*), 1101.

Wood and paper combined;  
 Ducrest, 60.

## Whippletrees and swingle-trees:

Randolph, 121.  
 Ransome, May, Biddell, and  
 Worby, 1186 (*Supp.*)  
 Newton, 443.  
 Cambridge, 741.

## Whip sockets:

Cockings and Potts, 591.  
 Middleton, 640.  
 Brown and Brown, 685.  
 Howes and Burley, 798.  
 Hewitt, 823.  
 Ghislin, 853.

## Wicker and cane used in construction of carriages:

Emery, 498.  
 Collier, Noble, and Ward,  
 672.  
 Reynolds and Dance, 784.  
 Lenny, 859.

## Wind guards:

Harsleben, 281.  
 Miller, 430.

## Windows:

Barbor, 67.  
 Randolph, 121.  
 Maberley and Barrow, 151.  
 Adams, 288.  
 Gillett and Chapman, 291.  
 Leak, 297.  
 Boddy, 365.  
 Heale, 378.  
 Chinnock, 393.

Windows—*cont.*

Horne, 420.  
 Britten, 426.  
 Heywood, 451.  
 Roberts, 539.  
 Haddan, 607.  
 Adams, 648.  
 Oxley, 716.  
 Hill, 736.  
 Howells and Howells, 770.  
 Train, 803.  
 Cole, 818.  
 Train (*Musgrove*), 824.  
 Stewart, 838.  
 Offord, 843.  
 Arrowsmith, 850.  
 La Mothe, 882.  
 Cooke, 885.  
 Snider, 935.  
 Brown, 954.  
 Fraser, 969.  
 Nottingham, 991.  
 Barker, 993.  
 Holbrook, 1017.  
 Marshall, 1042.  
 Fuller, Fuller, and Martin,  
 1073.  
 Courtauld and Atkinson,  
 1093.  
 Farnworth, 1096.  
 Wrigley and Westhead,  
 1108.  
 Pennington, 1111.  
 Farnworth, 1120.  
 Scott, 1133.  
 Elliott, 1154.  
 Imray and Ellis, 1162.  
 Gore, 1171.  
 Morgan and Morgan, 1182.

## Wings, dashers, &amp;c.:

Dyer, 422.  
 Simon and Humphreys,  
 491.  
 Swift, 604.  
 Broad, 651.  
 Shoner, 691.  
 Stewart, 838.  
 Wycherley, 951.  
 Russell, 1124.  
 Davies (*Singer*), 1149.



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### CONTENTS OF JOURNAL.

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Italy, Nos. 1061, 1064, 1656, 1666.  
— (Lucca), No. 321.  
— (Parma, Piacenza, and Guastalla), No. 321.  
— (Roman States), No. 319.  
— (Sardinia), Nos. 233, 235, 636, 637, 639, 640.  
— (Sicily), No. 316.  
Jamaica, No. 660.  
Japan, No. 1969.  
Mauritius and Dependencies, Nos. 1282, 2462.  
Mexico, No. 496.  
Natal, No. 1958.  
Netherlands, Nos. 289, 1643.  
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New South Wales, No. 386.

New Zealand, Nos. 861, 1639, 1940, 1974, 2644.

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Portugal, Nos. 325, 1026, 2036.

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United States of America, Nos. 638,

646, 753, 789, 887, 967, 1632, 1747, 1748,

1859, 1912, 1946, 1971, 1989, 2011, 2025,

2048, 2073, 2146, 2233, 2234, 2423, 2512,

2611, 2721, 2725, 2728, 2735, 2746, 2748,

2750.

Venezuela, No. 2036.

Victoria, Nos. 186, 359, 1622.

Western Australia, No. 2441.

Wurtemberg, Nos. 314, 995, 2036.

As to Colonial Patents, see Section V., Nos. 4 and 5.

The Trade Marks Laws and Regulations of Foreign States and of the British Colonies have been published in the following numbers of the Commissioners of Patents' Journal:—

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## V.

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6. COPY of AMERICAN PATENT SPECIFICATION, and other DOCUMENTS relating to an invention of "A new and useful "improved method or removing incrustation from boilers," presented by Davis Embree, of Dayton, Ohio, United States of America, to The Government and People of the United Kingdom of Great Britain and Ireland, 21st April 1865. Price 6d.; by post, 6½d.
7. SUPPLEMENT to the SERIES of LETTERS PATENT and SPECIFICATIONS, from A.D. 1617 to Oct. 1852; consisting for the most part of Reprints of scarce Pamphlets, descriptive of the early patented Inventions comprised in that Series.

#### CONTENTS.

1. Metallica; or the Treatise of Metallica, briefly comprehending the doctrine of diverse new metallical inventions, &c. By SIMON STURTEVANT. (*Letters Patent, dated 29th February 1611.*) Price 1s. 4d.; by post, 1s. 5d.
2. A Treatise of Metallica, but not that which was published by Mr. Simon Sturtevant, upon his Patent, &c. By JOHN ROVENZON. (*Letters Patent granted A.D. 1612.*) Price 4d.; by post, 4½d.
3. A Commission directed to Sir Richard Wynnne and others to inquire upon oath whether NICHOLAS PAGE or Sir NICHOLAS HALSE was the first inventor of certain kilnes for the drying of malt, &c. &c. (*Letters Patent, Nos. 71b and 85, respectively dated 10th July 1634, and 23rd July 1635.*) Price 2d.; by post, 2½d.
4. DUD DUDLEY's Metallum Martis; or iron made with pit-coale, sea-coale, &c. (*Letters Patent, Nos. 18 and 117, respectively dated 22nd February 1620, and 2nd May 1638.*) Price 8d.; by post, 8½d.
5. Description of the nature and working of the Patent Waterscoop Wheels invented by WILLIAM WHEELER, as compared with the raising wheels now in common use. By J. B. W. Translated from the Dutch by Dr. Tollhausen. (*Letters Patent, No. 127, dated 24th June 1642.*) Price 2s.; by post, 2s. 1½d.
6. An exact and true definition of the stupendous Water-commanding Engine invented by the Right Honourable (and deservedly to be praised and admired) EDWARD SOMERSET, Lord Marquis of WORCESTER, &c., &c. (*Stat. 15 Car. II. c. 12. A.D. 1663.*) Price 4d.; by post, 4½d.
7. Navigation improved; or the art of rowing ships of all rates in calms with a more easy, swift, and steady motion than oars can. By THOMAS SAVERY. (*Letters Patent, No. 347, dated 10th Jan. 1696.*) Price 1s.; by post, 1s. 0½d.
8. The Miner's Friend; or an engine to raise water by fire, described, &c. By THOMAS SAVERY. (*Letters Patent, No. 356, dated 25th July 1698, and Stat. 10 & 11 Will. III. No. 61, A.D. 1699.*) Price 1s.; by post, 1s. 1d.
9. Specimina Ichnographica; or a brief narrative of several new inventions and experiments, particularly the navigating a ship in a calm, &c. By JOHN ALLEN, M.D. (*Letters Patent No. 513, dated 7th August 1729.*) Price 8d.; by post, 9d.
10. A description and draught of a new-invented Machine for carrying vessels or ships out of or into any harbour, port, or river against wind and tide, or in a calm, &c. By JONATHAN HULLS. (*Letters Patent, No. 556, dated 21st December 1736.*) Price 8d.; by post, 9d.
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12. The letter of Master WILLIAM DRUMMOND for the construction of machines, weapons, and engines of war for attack or defence by land or sea, &c. Dated the 29th September 1626. (*Scotch Patent, temp. Car. II.*) Price 4d.; by post, 4½d.
13. Contributions to the History of the Steam Engine, being two deeds relating to the erection by Messrs. Boulton and Watt of steam engines on the United Mines at Gwennap, Cornwall, and at Werneth Colliery, near Oldham, Lancashire. From the originals in the Patent Office Library. Price 10d., by post, 10½d.



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### A.

Accordions. *See* Music, &c., 26.  
 Accoutrements. *See* Fire-arms, &c., 10.  
 Acetic acid. *See* Acids, 40.  
 Acids, &c., 40.  
 Aerated liquids. *See* Unfermented beverages, &c., 86.  
 Aerating water. *See* Purifying, &c., water, 79.  
 Aeronautics, 41.  
 Ageing fabrics. *See* Bleaching, &c., 14.  
 Agricultural engines. *See* Steam engine, 49.  
 Agriculture—barn and farmyard implements (including the cleansing, drying, and storing of grain), 82.  
 Agriculture—field implements and processes, 81.  
 Agriculture, steam. *See* Steam culture, 8.  
 Air, &c., engines, 62.  
 Air guns. *See* Fire-arms, &c., 10.  
 Air pumps of steam engines. *See* Steam engine, 49.  
 Alarum clocks. *See* Watches, &c., 9.  
 Alarums, electric. *See* Electricity, 15, 94.  
 Alarums, fire. *See* Fire engines, &c., 88.  
 Alarums, gas. *See* Gas, 17.  
 Albums. *See* Photography, 19; Books, 43.  
 Alkalies. *See* Acids, &c., 40.  
 Alloys. *See* Metals, &c., 18.  
 Alum. *See* Acids, &c., 40.  
 Alumina. *See* Acids, &c., 40.  
 Aluminium. *See* Metals, &c., 18; Acids, &c., 40.  
 Amalgamating metals. *See* Metals, &c., 18.  
 Ambulances. *See* Medicine, &c., 25; Common road carriages, 92.  
 Ammonia. *See* Acids, &c., 40.  
 Ammonium. *See* Acids, &c., 40.  
 Ammunition. *See* Fire-arms, &c., 10.  
 Anchors, 69.  
 Anchors for steam ploughing. *See* Agriculture, 81.  
 Anemometers. *See* Optical, &c., 76.

Aniline. *See* Bleaching, &c., 14.  
 Animal charcoal. *See* Sugar, 48.  
 Animals, medical and surgical treatment of. *See* Farriery, &c., 53.  
 Annealing furnaces. *See* Fuel, &c., 30.  
 Anthracite furnaces. *See* Fuel, &c., 30.  
 Antimony. *See* Metals, &c., 18; Acids, &c., 40.  
 Aqueducts. *See* Bridges, &c., 36.  
 Arches. *See* Bridges, &c., 36.  
 Armour plates, rolling. *See* Iron and Steel, 6.  
 Armour plates, shaping. *See* Ship-building, 21.  
 Arsenic. *See* Metals, &c., 18; Acids, &c., 40.  
 Arsenic acid and arsenious acid. *See* Acids, 40.  
 Artificial leather, 80.  
 Artists' instruments, &c., 54.  
 Asphalte. *See* Roads, &c., 35.  
 Astronomical instruments. *See* Optical, &c., 76.  
 Avellers. *See* Agriculture, 82.  
 Axles, axletrees, and axleboxes, for common road carriages. *See* Carriages for common roads, 92.  
 Axles, axletrees, and axle-boxes, for railway carriages, &c., *See* Carriages for railways, 46; Steam engine, 49.

### B.

Barrows. *See* Common road carriages, 92.  
 Bath chairs. *See* Common road carriages, 92.  
 Bagatelle tables. *See* Toys, &c., 51.  
 Bags. *See* Trunks, &c., 84.  
 Bags, paper. *See* Cutting, &c., 12.  
 Balances. *See* Raising, &c., 31.  
 Balancing, &c. millstones. *See* Grinding grain, 78.  
 Balloons. *See* Aeronautics, 41.  
 Balloons, toy. *See* Toys, 51.  
 Balls. *See* Toys, 51.  
 Band boxes. *See* Trunks, &c., 84.  
 Bands and belts. *See* Wearing apparel, 66.  
 Barium. *See* Acids, &c., 40.

Barley hummellers. *See* Agriculture, 82.  
 Barley mills. *See* Grinding grain, 78.  
 Barometers. *See* Optical, &c., 76.  
 Barrels, 74.  
 Baryta. *See* Acids, &c., 40.  
 Baskets. *See* Trunks, &c., 84.  
 Baths for medical use. *See* Medicine, &c., 25.  
 Bayonets. *See* Fire-arms, &c., 10.  
 Beacons. *See* Harbours, &c., 77.  
 Beads. *See* Wearing apparel, 68.  
 Beds and bedsteads. *See* Furniture, 39.  
 Beds and bedsteads for invalids. *See* Medicine, &c., 25; Furniture, 39.  
 Beer engines. *See* Hydraulics, 32.  
 Beetling. *See* Dressing, &c., 91.  
 Bellows. *See* Fuel, &c., 30.  
 Bells. *See* Music, &c., 26.  
 Belts, surgical. *See* Medicine, &c., 25.  
 Beverages, unfermented, 86.  
 Billiards. *See* Toys, &c., 51.  
 Bicycles. *See* Common road carriages, 92.  
 Bins for corn, &c. *See* Agriculture, 82.  
 Biscuits. *See* Cooking, 61.  
 Biscuit ware. *See* Pottery, 24.  
 Bismuth. *See* Acids, &c., 40.  
 Bits. *See* Saddlery, 34.  
 Blacking. *See* Skins, &c., 55; Wearing apparel, 67.  
 Blast furnaces. *See* Iron and steel, 6.  
 Bleaching, &c., fabrics, 14.  
 Bleaching fibrous substances. *See* Paper 11; Spinning, 28.  
 Blinds. *See* Furniture, 39.  
 Blinds, ventilating. *See* Ventilation, 52.  
 Blocks. *See* Raising &c., 31.  
 Boas. *See* Wearing apparel, 66.  
 Boat-building. *See* Ship-building, 21.  
 Boats, raising and lowering. *See* Raising, &c., 31; Masts, &c., 73.  
 Bobbin net. *See* Lace-making, 29.  
 Boiler plates. *See* Iron and steel, 6.  
 Boiler tubes. *See* Metallic pipes, 70.  
 Boilers of steam engines. *See* Steam engine, 49.  
 Bolting, &c., flour. *See* Grinding grain, 78.  
 Bolts. *See* Locks, &c., 60.  
 Bolts. *See* Nails, &c., 58.  
 Bonnet boxes. *See* Trunks, &c., 84.  
 Bonnets and bonnet boxes. *See* Wearing apparel, 65.  
 Books, &c., 43.  
 Boot-cleaning machines. *See* Brushing, 57.  
 Boot hooks. *See* Wearing apparel, 67.  
 Boot jacks. *See* Wearing apparel, 67.  
 Boots. *See* Wearing apparel, 67.  
 Boracic acid. *See* Acids, 40.  
 Bottling. *See* Preparing, &c., cork, &c., 56.  
 Boxes for pens, leads, &c. *See* Writing, 37.  
 Boxes. *See* Trunks, &c., 84.  
 Bracelets. *See* Wearing apparel, 68.  
 Braces. *See* Wearing apparel, 66.  
 Braid. *See* Lace-making, 29.  
 Brakes. *See* Carriages for railways, 46; Steam-engine, 49; Mining, 71.

Brakes for common road carriages. *See* Common road carriages, 92.  
 Brass. *See* Metals, &c., 18.  
 Bread-making. *See* Cooking, &c., 61.  
 Breakfast powders. *See* Tea, &c., 87.  
 Breakwaters. *See* Harbours, &c., 77.  
 Breast pins. *See* Wearing apparel, 68.  
 Breast-plates. *See* Fire-arms, &c., 10.  
 Breeches. *See* Wearing apparel, 66.  
 Bricks and tiles, 22.  
 Bricks, ventilating. *See* Ventilation, 52.  
 Bridges, &c., 36.  
 Broadshares. *See* Agriculture, 81.  
 Bromine. *See* Acids, &c., 40.  
 Brooches. *See* Wearing apparel, 68.  
 Bruising mills for beans, grain, gorse, &c. *See* Agriculture, 82.  
 Brushes for artists. *See* Artists' instruments, 54; Brushing, 57.  
 Brushing, &c., 57.  
 Buckles. *See* Wearing apparel, 68.  
 Buffers. *See* Carriages, &c., for railways, 46.  
 Bugles. *See* Music, &c., 26.  
 Bullet-making machines. *See* Fire arms, &c., 10.  
 Bungs. *See* Preparing and cutting cork, 56.  
 Buys. *See* Harbours, &c., 77.  
 Bustles. *See* Wearing apparel, 66.  
 Buttons. *See* Wearing apparel, 68.

## C.

Cable stoppers. *See* Raising, &c., 31.  
 Cables, telegraphic. *See* Electricity, 15.  
 Cabs. *See* Common road carriages, 92.  
 Caddies. *See* Trunks, &c., 84.  
 Cadmium. *See* Acids, &c., 40.  
 Cages, miners' safety. *See* Mining, 71.  
 Caissons. *See* Harbours, &c., 77.  
 Cake breakers. *See* Agriculture, 82.  
 Calcining furnaces. *See* Metals, &c., 18; Fuel, &c., 30.  
 Calcium. *See* Acids, &c., 40.  
 Calculating machines. *See* Optical, &c., 76.  
 Calendering. *See* Dressing and finishing, &c., 91.  
 Calico, bleaching, dyeing, and printing, 14.  
 Cameras. *See* Photography, 19; Optical, &c., 76.  
 Canal navigation. *See* Marine propulsion, 5.  
 Canals. *See* Harbours, &c., 77.  
 Candles. *See* Oils, &c., 27.  
 Candlesticks. *See* Lamps, &c., 44.  
 Cannon. *See* Fire-arms, 10.  
 Canvas. *See* Weaving, 20.  
 Capes. *See* Wearing apparel, 66.  
 Caps and cap fronts. *See* Wearing apparel, 65.  
 Caps and capsules. *See* Preparing and cutting cork, 56.

Capstans. *See* Raising, &c., 31.  
 Carbon. *See* Acids, &c., 40.  
 Carbonic acid. *See* Acids, 40.  
 Cardboard. *See* Paper, 11.  
 Card cases. *See* Books, &c., 43.  
 Carding engines. *See* Spinning, 28.  
 Cards. *See* Cutting, &c. paper, 12; Letterpress printing, &c., 13.  
 Cards, playing. *See* Toys, &c., 51.  
 Cargoes, ventilating. *See* Fire engines, &c., 88.  
 Carpet bags. *See* Trunks, &c., 84.  
 Carpets. *See* Weaving, 20.  
 Carriage lamps. *See* Lamps, 44.  
 Carriages for guns. *See* Fire-arms, &c., 10.  
 Carriages for invalids. *See* Medicine, &c., 25.  
 Carriages and other vehicles for common roads, 92.  
 Carriages, &c., for railways, 46.  
 Cartridges. *See* Fire-arms, &c., 10.  
 Cartridges, miner's. *See* Mining, 71.  
 Carts. *See* Common road carriages, 92.  
 Cask stands. *See* Casks, 74.  
 Caskets. *See* Trunks, &c., 84.  
 Casks, 74.  
 Casting metals. *See* Metals, &c., 18.  
 Castors. *See* Furniture, 39.  
 Cattle food, preparing on the farm, not manufacturing for sale. *See* Agriculture, 82.  
 Cattle medicines. *See* Farriery, &c., 53.  
 Cement, brush maker's. *See* Brushing, 57.  
 Centre boards. *See* Steering, 75.  
 Cesspools. *See* Waterclosets, &c., 63.  
 Chaff-cutters. *See* Agriculture, 82.  
 Chains, chain cables, &c., 90.  
 Chains, jewellery. *See* Wearing apparel, 68; Chains, &c., 90.  
 Chairs. *See* Furniture, 39.  
 Chairs, invalid. *See* Medicine, 25; Furniture, 39.  
 Chalybeate waters. *See* Unfermented beverages, &c., 86.  
 Chamber utensils. *See* Waterclosets, &c., 63.  
 Chandeliers. *See* Lamps, &c., 44.  
 Charcoal, animal. *See* Sugar, 48.  
 Cheese making. *See* Milking, &c., 72.  
 Chemises. *See* Wearing apparel, 66.  
 Chenille. *See* Lace-making, 29.  
 Chess. *See* Toys, 51.  
 Chests. *See* Trunks, &c., 84.  
 Chicory, manufacturing and preparing for sale. *See* Tea, &c., 87.  
 Chimneys and chimney tops. *See* Fuel, &c., 30.  
 Chimneys sweeping. *See* Brushing, 57.  
 Chinaware. *See* Pottery, 24.  
 Chlorine. *See* Acids, &c., 40.  
 Chocolate or cocoa, concentrated extracts of. *See* Tea, &c., 87.  
 Chocolate or cocoa, manufacturing and preparing for sale. *See* Tea, &c., 87.  
 Chocolate, preparing as a drink. *See* Unfermented beverages, &c., 86.  
 Chlorium. *See* Acids, &c., 40.

Chromo-lithography. *See* Letterpress and similar printing, 13; Ornamenting paper, &c., 12.  
 Churning. *See* Milking, &c., 72.  
 Cigars, cigarettes, and cigar holders. *See* Tobacco, 42.  
 Cinder sifters. *See* Fuel, &c., 30.  
 Cisterns. *See* Hydraulics, 32.  
 Citric acid. *See* Acids, 40.  
 Clasps and clips. *See* Writing, &c., 37.  
 Cleaning grain. *See* Agriculture, 82.  
 Clinometers. *See* Optical, &c., 76.  
 Clipping horses. *See* Farriery, &c., 53.  
 Cloaks. *See* Wearing apparel, 66.  
 Clocks. *See* Watches, &c., 9.  
 Clod crushers. *See* Agriculture, 81.  
 Clogs. *See* Wearing apparel, 67.  
 Coal scuttles. *See* Fuel, &c., 30.  
 Coating metals. *See* Metals, &c., 18  
 Plating, &c., metals, 23.  
 Coats. *See* Wearing apparel, 66.  
 Cobalt. *See* Metals, 18; Acids, &c., 40.  
 Cocks. *See* Hydraulics, 32.  
 Cocoa or chocolate, concentrated extracts of. *See* Tea, &c., 87.  
 Cocoa or chocolate, manufacturing and preparing for sale. *See* Tea, &c., 87.  
 Cocoa, preparing as a drink. *See* Unfermented beverages, &c., 86.  
 Coffee, concentrated extracts of. *See* Tea, &c., 87.  
 Coffee, manufacturing and preparing for sale. *See* Tea, &c., 87.  
 Coffee mills. *See* Grinding grain, &c., 78.  
 Coffee, preparing as a drink. *See* Unfermented beverages, &c., 86.  
 Coffor dams. *See* Bridges, 36; Harbours, &c., 77.  
 Coke ovens. *See* Fuel, &c., 30.  
 Collars. *See* Wearing apparel, 66.  
 Collars for horses. *See* Saddlery, 34.  
 Colours. *See* Paints, 50.  
 Colours, artists'. *See* Artists instruments, &c., 54.  
 Combing machines. *See* Spinning, 28.  
 Commodes. *See* Furniture, 39; Waterclosets, &c., 63.  
 Compasses, drawing. *See* Optical, &c., 76.  
 Compasses, magnetic. *See* Optical, &c., 76.  
 Compasses, mariners'. *See* Optical, &c., 76.  
 Concertinas. *See* Music, &c., 26.  
 Condensers of steam engines. *See* Steam engine, 49.  
 Confectionery. *See* Cooking, &c., 61.  
 Confectionery ices. *See* Ice-making, &c., 85.  
 Conveying water. *See* Hydraulics, 32.  
 Cooking, &c., 61.  
 Copper. *See* Metals, &c., 18.  
 Copper oxides, &c. *See* Acids, &c., 40.  
 Copying presses. *See* Writing, &c., 37.  
 Corkcutting, &c., 56.  
 Corkscrews. *See* Preparing and cutting cork, 56.  
 Corn, thrashing, cleansing, drying, and storing. *See* Agriculture, 82.  
 Cornets. *See* Music, 26.  
 Cots and cradles. *See* Furniture, 39.

Cotton gins. *See* Spinning, 28.  
 Couches. *See* Furniture, 39.  
 Counting number of passengers in common road carriages. *See* Common road carriages, 92.  
 Couplings for tubes. *See* Metallic pipes, &c., 70.  
 Covers of vehicles. *See* Common road carriages, 92.  
 Crab-winchies, steam. *See* Raising, &c., 31; Steam engine, 49.  
 Cranes. *See* Raising, &c., 31.  
 Cranes, hydraulic. *See* Raising, &c., 31; Hydraulics, 32.  
 Cranes, steam. *See* Raising, &c., 31; Steam engine, 49.  
 Crates. *See* Trunks, &c., 84.  
 Cravats. *See* Wearing apparel, 66.  
 Crayons. *See* Artists' instruments, &c., 54.  
 Crayons and crayon holders. *See* Writing, &c., 37; Artists' instruments, &c., 54.  
 Cricket. *See* Toys, &c., 51.  
 Crinolines. *See* Wearing apparel, 66.  
 Crochet needles and holders. *See* Needles, 45.  
 Croquet. *See* Toys, &c., 51.  
 Crushing grain, &c. *See* Grinding grain, 78.  
 Crushing, breaking, &c., ores, &c. *See* Iron, 6; Metals, &c., 18; Roads, 35.  
 Crushing mills for beans, gorse, grain, &c. *See* Agriculture, 82.  
 Cuirasses. *See* Fire-arms, &c., 10.  
 Cultivators. *See* Agriculture, 81.  
 Curricule bars. *See* Common road carriages, 92.  
 Currycombs. *See* Saddlery, 34.  
 Curtains. *See* Furniture, 39.  
 Cutting roots, straw, &c. *See* Agriculture, 82.  
 Cyanogen. *See* Acids, &c., 40.

## D.

Dams. *See* Harbours, &c., 77.  
 Dash wheels. *See* Bleaching, &c., 14.  
 Decoctions, unconcentrated. *See* Unfermented beverages, &c., 86.  
 Decorticating grain and seeds. *See* Grinding grain, 78.  
 Dentistry. *See* Medicine, 25.  
 Derricks. *See* Raising, &c., 31.  
 Derricks, steam. *See* Raising, &c., 31; Steam engine, 49.  
 Desks. *See* Writing, 37.  
 Despatch boxes. *See* Trunks, &c., 84.  
 Detonating signals. *See* Railway signals, 38.  
 Dibbles. *See* Agriculture, 81.  
 Dies. *See* Ornamenting paper, &c., 12.  
 Diggers and digging machines. *See* Agriculture, 81.  
 Distance indicators for common road carriages. *See* Common road carriages, 92.  
 Diving apparatus. *See* Raising, &c., 31.

Docks. *See* Harbours, &c., 77.  
 Dolls. *See* Toys, 51.  
 Door-springs. *See* Hinges, &c., 59.  
 Drags. *See* Common road carriages, 92.  
 Draining mines. *See* Mining, 71.  
 Drain pipes, laying. *See* Agriculture, 81.  
 Drain ploughs. *See* Agriculture, 81.  
 Drain tiles and pipes. *See* Drains, &c., 1.  
 Drains and sewers, 1.  
 Draughts and draughtboards. *See* Toys, 51.  
 Drawers. *See* Wearing apparel, 66.  
 Drawing instruments. *See* Writing, &c., 37; Artists', &c., 54; Optical, mathematical, &c., 76.  
 Dredgers, steam. *See* Steam engine, 49; Harbours, &c., 77.  
 Dredging. *See* Raising, &c., 31; Harbours, &c., 77.  
 Dress fastenings. *See* Wearing apparel, 68.  
 Dressing and finishing woven fabrics, &c., 91.  
 Dressing cases. *See* Trunks, &c., 84.  
 Dressing flour and meal. *See* Grinding grain, 78.  
 Dressing millstones. *See* Grinding grain, 78.  
 Drills, seed and manure. *See* Agriculture, 81.  
 Drums. *See* Music, &c., 26.  
 Dry docks. *See* Harbours, &c., 77.  
 Drying grain, hops, roots, hay, &c. *See* Agriculture, 82.  
 Dyeing. *See* Bleaching, &c., 14.  
 Dynamometers. *See* Optical, &c., 76.

## E.

Earrings. *See* Wearing apparel, 68.  
 Earth closets. *See* Waterclosets, &c., 63.  
 Earthenware. *See* Pottery, 24.  
 Easels. *See* Artists' instruments, 54.  
 Effervescing drinks. *See* Unfermented beverages, &c., 86.  
 Elastic bands. *See* India rubber, 16;  
 Lace-making, 29.  
 Elastic cloths. *See* Weaving, 20;  
 Lace-making, 29.  
 Electric lighting, &c., 95.  
 Electricity, &c., 15; 92; 93; 94; 95;  
 96; 97.  
 Elevators or stackers. *See* Agriculture, 82.  
 Embankments. *See* Harbours, &c., 77.  
 Embossing. *See* Ornamenting paper, 12; Letterpress printing, 13; Dressing, &c. fabrics, 91.  
 Embroidering. *See* Sewing, 2.  
 Endless travelling railways. *See* Aids to locomotion, 7; Common road carriages, 92.  
 Engraving, embossing, and printing rollers. *See* Ornamenting paper, 12; Bleaching, &c. fabrics, 14.

Engravings. *See* Letterpress printing, &c., 13; Artists' instruments, 54.  
 Envelopes. *See* Cutting, folding, &c. paper, 12.  
 Excavating. *See* Harbours, &c., 77.  
 Exercises. *See* Toys, &c., 51.  
 Explosive compounds. *See* Fire-arms, &c., 10.  
 Explosive compounds for blasting. *See* Mining, &c., 71.  
 Extracts, unconcentrated. *See* Unfermented beverages, &c., 86.  
 Eyelets. *See* Wearing apparel, 68.

## F.

Fan blowers. *See* Fuel, &c., 30.  
 Fans, rotary. *See* Ventilation, 52.  
 Fares, checking, &c. *See* Common road carriages, 92.  
 Farriery, &c., 53.  
 Fats. *See* Oils, &c., 27.  
 Feeding bottles. *See* Medicine, 25.  
 Feeding troughs. *See* Agriculture, 82.  
 Felting. *See* Dressing and finishing, &c., 91.  
 Field implements and processes for agriculture, 81.  
 Filters, water. *See* Purifying, &c. water, 79.  
 Filters, sugar. *See* Sugar, 48.  
 Finishing fabrics. *See* Dressing, &c., 91.  
 Fins, steering. *See* Steering, &c., 75.  
 Fire-arms, &c., 10.  
 Fire-arms, toy. *See* Toys, 51.  
 Fire bars. *See* Fuel, &c., 30.  
 Fire engines, 88.  
 Fire escapes, 88.  
 Fire extinguishers, 88.  
 Fire-grates. *See* Fuel, &c., 30.  
 Fire-proof depositories, *See* Safes, &c., 64.  
 Fire-proof dresses and fabrics. *See* Fire engines, &c., 88.  
 Fireworks. *See* Toys, 51.  
 Flageolets. *See* Music, &c., 26.  
 Flesh brushes. *See* Brushing, 57.  
 Floating docks. *See* Harbours, &c., 77.  
 Floorcloth, 80.  
 Flues. *See* Fuel, &c., 30.  
 Fluorine. *See* Acids, &c., 40.  
 Flutes. *See* Music, &c., 26.  
 Fog signals. *See* Railway signals, 38.  
 Folding fabrics. *See* Dressing, &c., 91.  
 Folding paper. *See* Cutting, &c., 12.  
 Food for cattle, preparing on the farm, not manufacturing for sale. *See* Agriculture, 82.  
 Food, preservation of, 4.  
 Footways. *See* Roads, &c., 35.  
 Fountains. *See* Hydraulics, 32.  
 Freezing mixtures. *See* Ice-making, &c., 85.  
 Frills and frillings. *See* Wearing apparel, 66.  
 Fringe. *See* Lace-making, &c., 29.

Fruit-cleaning machines. *See* Brushing, 57.  
 Fruit, machinery for paring, slicing, &c. *See* Cooking, &c., 61.  
 Fuel, 30.  
 Fulling. *See* Dressing and finishing, &c., 91.  
 Funeral carriages. *See* Common road carriages, 92.  
 Furnaces. *See* Iron and steel, 6; Metals and alloys, 18; Fuel, &c., 30; Steam engine, 49.  
 Furniture, &c., 39.  
 Furze crushers. *See* Agriculture, 82.  
 Fusees and fusee cases. *See* Tobacco, 42.  
 Fuses for firing blasting charges. *See* Mining, 71.

## G.

Gaiters. *See* Wearing apparel, 66.  
 Galvanic batteries. *See* Electricity, 15; 92.  
 Games. *See* Toys, 51.  
 Garters. *See* Wearing apparel, 66.  
 Gas, 17.  
 Gas engines. *See* Air, &c., engines, 62.  
 Gas meters. *See* Gas, 17.  
 Gasometers. *See* Gas, 17.  
 Gas stoves. *See* Gas, 17; Fuel, &c., 30.  
 Gas tubes. *See* Metallic pipes, 70.  
 Gates, dock. *See* Harbours, &c., 77.  
 Gates, lock. *See* Harbours, &c., 77.  
 Gauges, air. *See* Ventilation, 52.  
 Gauges, steam. *See* Steam engine, 49.  
 Gauges, water. *See* Hydraulics, 32; Steam engine, 49.  
 Gig mills. *See* Dressing, &c., 91.  
 Girths. *See* Saddlery, 34.  
 Globes. *See* Optical, &c., 76.  
 Globes for lamps. *See* Lamps, 44.  
 Glove fastenings. *See* Wearing apparel, 68.  
 Gloves. *See* Wearing apparel, 66.  
 Gloves of thread. *See* Lace-making, 29.  
 Gold. *See* Metals, &c., 18; Acids, &c., 40.  
 Goloshes. *See* Wearing apparel, 67.  
 Gorse and grain crushers. *See* Agriculture, 82.  
 Grain, thrashing, cleansing, sorting measuring, weighing, preserving, storing, &c. *See* Agriculture, 82.  
 Granaries. *See* Agriculture, 82.  
 Graphometers. *See* Optical, &c., 76.  
 Grates. *See* Fuel, &c., 30.  
 Graving docks. *See* Harbours, &c., 77.  
 Gridirons for repairing ships. *See* Harbours, &c., 77.  
 Grinding grain, 78.  
 Grooming horses by machinery. *See* Brushing, 57.  
 Grubbers. *See* Agriculture, 81.  
 Guitars. *See* Music, &c., 26.  
 Gunboats. *See* Ship-building, 21.  
 Gunpowder. *See* Fire-arms, 10.  
 Gutta-percha. *See* India-rubber, 16.  
 Gutters. *See* Drains, 1; Roads, 35.  
 Gymnastics. *See* Medicine, &c., 25; Toys, 51.

## H.

Habits. *See* Wearing apparel, 66.  
 Hair-brushing machinery. *See* Brushing, 57.  
 Hair cloth. *See* Weaving, 20.  
 Hair pins. *See* Needles, &c., 45.  
 Hammers, steam. *See* Steam engine, 49.  
 Hammocks. *See* Furniture, 39.  
 Hand barrows. *See* Common road carriages, 92.  
 Harbours, &c., 77.  
 Harmoniums. *See* Music, &c., 26.  
 Harness. *See* Saddlery, 34.  
 Harps and harpsichords. *See* Music, &c., 26.  
 Harrows. *See* Agriculture, 81.  
 Harvesters. *See* Agriculture, 81.  
 Hassocks. *See* Furniture, 39.  
 Hat boxes. *See* Trunks, &c., 84.  
 Hats, hat bands, and hat boxes. *See* Wearing apparel, 65.  
 Haymakers. *See* Agriculture, 81.  
 Hay rakes. *See* Agriculture, 81.  
 Hay, stacking, packing, and cutting. *See* Agriculture, 82.  
 Head coverings. *See* Wearing apparel, 65.  
 Hearses. *See* Common road carriages, 92.  
 Heating by electricity. *See* Electricity, 95.  
 Heckling machines. *See* Spinning, 28.  
 Heliography. *See* Photography, 19.  
 Helmets. *See* Fire-arms, &c., 10; Wearing apparel, 65.  
 Hides. *See* Skins, 55.  
 Hinges and hinge joints, 59.  
 Hoes. *See* Agriculture, 81.  
 Hoists. *See* Raising, &c., 31.  
 Hoists, steam. *See* Raising, &c., 31; Steam-engine, 49.  
 Hooks and eyes. *See* Wearing apparel, 68.  
 Hop cultivation. *See* Agriculture, 81.  
 Hops, drying and pocketing. *See* Agriculture, 82.  
 Horns. *See* Music, &c., 26.  
 Horse gear. *See* Agriculture, 82.  
 Horse medicines. *See* Farriery, 53.  
 Horse shoes and horse shoe nails. *See* Farriery, 53.  
 Hose pipes. *See* Fire engines, &c., 88.  
 Hosiery. *See* Wearing apparel, 66.  
 Hospitals. *See* Medicine, &c., 25.  
 Hot pressing. *See* Dressing, &c., 91.  
 House carts. *See* Common road carriages, 92.  
 Hulling, &c., grain. *See* Grinding grain, 78.  
 Hummellers. *See* Agriculture, 82.  
 Hydrants. *See* Hydraulics, 32.  
 Hydraulics, 32.  
 Hydrochloric acid. *See* Acids, 40.  
 Hydrocyanic acid. *See* Acids, 40.

Hydrogen. *See* Acids, &c., 40.  
 Hydro-propulsion. *See* Marine propulsion, 5.  
 Hygrometers. *See* Optical, &c. 76.

## I.

Ice creams. *See* Ice-making, &c., 85.  
 Ice houses, 85.  
 Ice-making machines, 85.  
 Ice pails. *See* Ice-making, &c., 85.  
 Ice safes, 85.  
 Ice wells. *See* Ice-making, &c., 85.  
 Igniting by electricity. *See* Electricity, 95.  
 India-rubber, 16.  
 India-rubber horse-shoes. *See* Farriery, 53.  
 Indicators for common road carriages. *See* Common road carriages, 92.  
 Infusions, unconcentrated. *See* Unfermented beverages, &c., 86.  
 Ink and inkstands. *See* Writing, &c., 37.  
 Ink, printers'. *See* Printing, &c., 13.  
 Insulators. *See* Electricity, 15; 93.  
 Invalid bedsteads. *See* Medicine, &c., 25; Furniture, 39.  
 Invalid carriages. *See* Common road carriages, 92.  
 Iodine. *See* Acids, &c., 40.  
 Iron and steel, 6.  
 Iron oxides, &c. *See* Acids, &c., 40.  
 Ironing. *See* Dressing and finishing &c., 91.  
 Irrigating and watering land. *See* Agriculture, 81.

## J.

Jackets. *See* Wearing apparel, 66.  
 Jacks, hydraulic. *See* Hydraulics, 32.  
 Jacks, roasting. *See* Cooking, 61.  
 Jacks, screw. *See* Raising, &c., 31.  
 Jacquard machines. *See* Weaving, 20; Lace, 29;  
 Jewellery. *See* Wearing apparel, 68.

## K.

Kaleidoscopes. *See* Optical, &c., 76.  
 Kamptulicon. *See* Artificial leather, &c., 80.  
 Keels, sliding. *See* Steering, 75.  
 Kegs. *See* Casks, 74.  
 Kettles for the table. *See* Unfermented beverages, &c., 86.  
 Kilns for drying hops, grain, &c. *See* Agriculture, 82.  
 Kilns. *See* Bricks and tiles, 22; Pottery, 24; Fuel, &c., 30.  
 Kites. *See* Aeronautics, 41; Toys, 51.  
 Knapsacks. *See* Fire-arms, &c., 10.  
 Kneading machines. *See* Cooking, &c. 61.

Knife cleaners. *See* Brushing, 57.  
Knitting machines. *See* Lace, 29.  
Knobs. *See* Furniture, &c., 39; Locks, 60.

## L.

Labels. *See* Writing, &c., 37.  
Lace-making, knitting, netting, &c., 29.  
Lampblack. *See* Paints, 50.  
Lamps, &c., 44.  
Lamps, cooking. *See* Lamps, 44; Cooking, 61.  
Lasts for making boots and shoes. *See* Wearing apparel, 67.  
Latches. *See* Locks, &c., 60.  
Launching vessels. *See* Ship-building, 21.  
Lead. *See* Metals, &c., 18.  
Lead for paints. *See* Paints, 50.  
Lead, oxides, &c. *See* Acids, &c., 40.  
Leather. *See* Skins, &c., 55.  
Leather cloth. *See* Artificial leather, 80.  
Lee boards. *See* Steering, &c., 75.  
Leggings. *See* Wearing apparel, 66.  
Lemonade. *See* Unfermented beverages, &c., 86.  
Lemon and other fruit squeezers. *See* Unfermented beverages, &c., 86.  
Lenses. *See* Optical, &c., 76.  
Letterpress and similar printing, 13.  
Levels. *See* Optical, &c., 76.  
Lifts. *See* Raising, 31.  
Lifts, steam. *See* Raising, 31; Steam engine, 49.  
Light, electric, &c., 95.  
Lighthouse lamps. *See* Lamps, 44.  
Lighthouses. *See* Harbours, &c., 77.  
Lighting mines. *See* Mining, 71.  
Limbs, artificial. *See* Medicine, &c., 25.  
Lime. *See* Acids, &c., 40.  
Lime light. *See* Lamps, &c., 44.  
Links. *See* Chains, &c., 90.  
Linoleum. *See* Artificial leather, &c., 80.  
Liqueurs. *See* Unfermented beverages, &c., 86.  
Lithography. *See* Printing 13; Ornamenting paper, 12.  
Loading hay, straw, &c. *See* Agriculture, 81.  
Lockets. *See* Wearing apparel, 68.  
Locks, &c., 60.  
Locks, canal, &c. *See* Harbours, &c., 77.  
Locks for guns. *See* Fire-arms, 10.  
Locomotion, aids to, 7.  
Locomotive steam carriages. *See* Steam engine, 49.  
Logs. *See* Optical, &c., 76.  
Looking-glasses. *See* Furniture, 39.  
Looms. *See* Weaving, 20.  
Looped fabrics. *See* Lace-making, &c., 29.  
Lowering apparatus. *See* Raising, &c., 31.

Lozenges. *See* Medicine, 25; Cooking, 61.  
Lubricants. *See* Oils, &c., 27.

## M.

Machine needles. *See* Needles, 45.  
Magic lanterns. *See* Toys, 51.  
Magnesia. *See* Acids, &c., 40.  
Magnesium. *See* Acids, &c., 40.  
Magnetism. *See* Electricity, 15; 92; 93; 94; 95; 96; 97.  
Malt mills. *See* Grinding grain, 78.  
Manganese. *See* Acids, &c., 40.  
Mangers. *See* Saddlery, &c., 34.  
Mangling. *See* Dressing and finishing, &c., 91.  
Manifold writers. *See* Writing, 37.  
Manœuvring ships and vessels. *See* Steering, &c., 75.  
Mantillas and mantles. *See* Wearing apparel, 66.  
Manure, 3.  
Manure distributors. *See* Agriculture, 81.  
Marine engines. *See* Marine propulsion, 5; Steam engine, 49.  
Marine propulsion, 5.  
Mariners' compasses. *See* Optical, &c., 76.  
Masts, &c., 73.  
Mathematical instruments. *See* Artists' instruments, 54; Optical, &c., 76.  
Mattresses. *See* Furniture, 39.  
Measuring and mixing grain. *See* Agriculture, 82.  
Meat screens. *See* Cooking, 61.  
Medicine, &c., 25.  
Medicine, and medicated food for animals. *See* Farriery, 53.  
Memorandum books. *See* Books, 43.  
Mercury. *See* Acids, &c., 40.  
Metals and alloys, 18.  
Metals, plating, &c., 23.  
Metals, separating. *See* Metals, &c., 18.  
Meteorological instruments. *See* Optical, &c., 76.  
Meters, gas. *See* Gas, 17.  
Meters, water. *See* Hydraulics, 32.  
Micrometers. *See* Optical, &c., 76.  
Microscopes. *See* Optical, &c., 76.  
Milking, &c., 72.  
Millboard. *See* Paper, 11.  
Mills, barley. *See* Grinding grain, 78.  
Mills, coffee. *See* Grinding grain, 78.  
Mills, flour. *See* Grinding grain, 78.  
Mills, malt. *See* Grinding grain, 78.  
Mills, paint. *See* Paints, 50.  
Mills, sugar. *See* Sugar, 48.  
Mills, water. *See* Hydraulics, 32; Grinding grain, 78.  
Millstones. *See* Grinding grain, 78.  
Millstones, balancing. *See* Grinding grain, 78.  
Millstones, dressing, &c. *See* Grinding grain, 78.  
Mincing machines. *See* Cooking, 61.



Mineral waters. *See* Unfermented beverages, &c., 86.

Miners' lamps. *See* Lamps, 44.

Mines, ventilating. *See* Ventilation, 52.

Mining, &c., 71.

Mittens. *See* Wearing apparel, 66.

Mordants. *See* Bleaching, &c., 14.

Motive power. *See* Hydraulics, 32; Steam engine, 49; Air and gas engines, 62.

Moulds, sugar. *See* Sugar, 48.

Mowers. *See* Agriculture, 81.

Muffs. *See* Wearing apparel, 66.

Mules. *See* Spinning, 28.

Muriatic acid. *See* Acids, 40.

Music and musical instruments, 26.

Music stands. *See* Music, &c., 26.

## N.

Nails, &c., 58.

Nails, horse-shoe. *See* Farriery, 53; Nails, 58.

Nautical instruments. *See* Optical, &c., 76.

Necklaces and necklets. *See* Wearing apparel, 68.

Neckties. *See* Wearing apparel, 66.

Needle cases. *See* Sewing, 2.

Needles and pins, 45.

Needles for knitting. *See* Lace-making, &c., 22.

Net, bobbin. *See* Lace-making, &c., 29.

Nets, fishing. *See* Lace-making, &c., 29.

Nickel. *See* Metals, &c., 18; Acids, &c., 40.

Nitre. *See* Acids, &c., 40.

Nitric acid. *See* Acids, 40.

Nitrogen. *See* Acids, &c., 40.

Nosebags. *See* Saddlery, 34.

Nuts. *See* Nails, &c., 58.

## O.

Cars. *See* Marine propulsion, 5.

Oat mills. *See* Agriculture, 82.

Oats, thrashing, cleaning, drying, storing, &c. *See* Agriculture, 82.

Octants. *See* Optical, &c., 76.

Oilcloth, 80.

Oils, &c., 27.

Oilskin, 80.

Optical, &c., instruments, 76.

Ordnance. *See* Fire-arms, 10.

Organs. *See* Music, &c., 26.

Ovens. *See* Fuel, &c., 30.

Ovens, bakers'. *See* Fuel, &c., 30; Cooking, 61.

Overalls. *See* Wearing apparel, 66.

Overcoats. *See* Wearing apparel, 66.

Overshoes. *See* Wearing apparel, 67.

Oxalic acid. *See* Acids, 40.

Oxides. *See* Acids, &c., 40.

Oxygen. *See* Acids, &c., 40.

## P.

Packing cases. *See* Trunks, &c., 84.

Packing fabrics. *See* Dressing and finishing, 91.

Packing for pistons of steam engines. *See* Steam engine, 49.

Paddle-wheels. *See* Marine propulsion, 5.

Paints, &c., 50.

Paints for artists. *See* Artists' instruments, &c., 54.

Pantaloons. *See* Wearing apparel, 66.

Paper, cutting, folding, and ornamenting, 12.

Paper making, 11.

Paperhangings. *See* Ornamenting paper, 12.

Papier maché. *See* Paper, 11.

Parachutes. *See* Aeronautics, 41.

Parasols. *See* Umbrellas, 47.

Passenger register for vehicles. *See* Common road carriages, 92.

Pasteboard. *See* Paper making, 11; Cutting, &c., paper, 12.

Pattens. *See* Wearing apparel, 67.

Paving. *See* Roads, 35.

Peat. *See* Fuel, &c., 30.

Pedometers. *See* Optical, &c., 76.

Pencil cases and holders. *See* Writing, &c., 37; Artists' instruments, 54.

Pencil cases, boxes to hold leads for. *See* Writing, &c., 37.

Pens and penholders. *See* Writing, &c., 37; Artists' instruments, 54.

Pens, boxes for holding. *See* Writing &c., 37.

Pepper, hulling. *See* Grinding grain, 78.

Perambulators. *See* Common road carriages, 92.

Perforating paper. *See* Cutting, &c., paper, 12.

Perpetual motion. *See* Hydraulics, 32; Air, &c., engines, 62.

Petticoats. *See* Wearing apparel, 66.

Phenakistoscopes. *See* Photography, 19; Optical, &c., 76.

Phenic acid. *See* Acids, 40.

Philosophical instruments. *See* Optical, &c., 76.

Phosphoric acid. *See* Acids, 40.

Phosphorus. *See* Acids, &c., 40.

Photography, 19.

Pianofortes. *See* Music, &c., 26.

Picture frames. *See* Furniture, 39.

Piers. *See* Harbours, &c., 77.

Pile drivers, steam. *See* Steam engine, 49; Harbours, &c., 77.

Pile fabrics. *See* Weaving, 20; Lace-making, 29.

Pile or nap, raising and cutting. *See* Dressing, &c., 91.

Piles. *See* Harbours, &c., 77.

Pins. *See* Needles, &c., 45.

Pipes. *See* Tobacco, 42.

Pipes, drain. *See* Drains, 1.

Pipes, metallic, 70.  
Pistols. *See* Fire-arms, 10.  
Pistons of steam engines. *See* Steam engine, 49.  
Pit chains. *See* Mining, &c., 71.  
Plaiting. *See* Lace, &c., 29.  
Plating metals, 23.  
Playing cards. *See* Toys, 51.  
Ploughs and ploughing machines. *See* Agriculture, 81.  
Plumb levels. *See* Optical, &c., 76.  
Pocket books. *See* Books, 43.  
Porcelain. *See* Pottery, 24.  
Portfolios. *See* Books, 43.  
Portfolios for music. *See* Music, 26.  
Portmanteaus. *See* Trunks, &c., 84.  
Potash. *See* Acids, &c., 40.  
Potash water. *See* Unfermented beverages, &c., 86.  
Potassium. *See* Acids, &c., 40.  
Potato diggers. *See* Agriculture, 81.  
Pottery, 24.  
Pouches for tobacco. *See* Tobacco, 42.  
Powder flasks. *See* Fire-arms, &c., 10.  
Power looms. *See* Weaving, 20.  
Precious stones, cutting, &c. *See* Wearing apparel, 68.  
Precious stones, setting. *See* Wearing apparel, 68.  
Presses, hydraulic. *See* Hydraulics, 32.  
Presses, printing, 13.  
Presses, stamping. *See* Cutting, &c. paper, 12; Letterpress printing, 13.  
Pressing fabrics. *See* Dressing and finishing, 91.  
Printing fabrics, yarns, &c. *See* Bleaching, &c., 14.  
Printing, letterpress, &c., 13.  
Projectiles. *See* Fire-arms, &c., 10.  
Propellers. *See* Marine propulsion, 5.  
Propulsion, marine, 5.  
Prussic acid. *See* Acids, 40.  
Puddling furnaces. *See* Iron and steel, 6.  
Pug mills. *See* Bricks and tiles, 22.  
Pulleys. *See* Raising, &c., 31.  
Pulverizers. *See* Agriculture, 81.  
Pumps. *See* Hydraulics, 32.  
Pumps, steam. *See* Hydraulics, 32; Steam engine, 49.  
Punkas. *See* Ventilation, 52.  
Purifying and filtering water, 79.  
Pyrometers. *See* Optical, &c., 76.

## Q.

Quadrants. *See* Optical, &c., 76.  
Quarrying. *See* Mining, &c., 71.  
Quays. *See* Harbours, &c., 77.  
Quinine. *See* Acids, &c., 40.

## R.

Rafts. *See* Ship-building, 21.  
Railway carriages. *See* Carriages, &c., for railways, 46.

Railway signals, &c., 33.  
Railways, 33.  
Railways, portable endless. *See* Aids to locomotion, 7; Common road carriages, 92.  
Raising, &c., 31.  
Raising and lowering ships' boats. *See* Raising, &c., 31; Masts, &c., 73.  
Raising ships for repairing. *See* Ship-building, &c., 21.  
Raising water. *See* Hydraulics, 32.  
Rakes. *See* Agriculture, 81.  
Ranges, cooking. *See* Fuel, &c., 30; Cooking, 61.  
Reaping and mowing machines. *See* Agriculture, 81.  
Reflectors. *See* Lamps, 44.  
Refrigerators. *See* Ice-making, &c., 85.  
Registering number of passengers in common road carriages. *See* Common road carriages, 92.  
Reservoirs. *See* Harbours, &c., 77.  
Respirators. *See* Medicine, &c., 25.  
Reticules. *See* Trunks, &c., 84.  
Retorts for burning animal charcoal. *See* Sugar, 48.  
Retorts, gas. *See* Gas, 17.  
Reverberatory furnaces. *See* Iron and steel, 6.  
Rice, hulling, &c. *See* Grinding grain, 78.  
Rice, milling, polishing, and otherwise preparing for the market. *See* Agriculture, 82.  
Rick covers. *See* Artificial leather, &c., 80.  
Ricks. *See* Agriculture, 82.  
Riddles for grain, &c. *See* Agriculture, 82.  
Rigging. *See* Masts, &c., 73.  
Rings, finger. *See* Wearing apparel, 68.  
Rinsing. *See* Washing, &c., 89.  
Rivets. *See* Nails, &c., 58.  
Road sweepers. *See* Brushing, 57.  
Roads and ways, 35.  
Roasting jacks. *See* Cooking, 61.  
Rockets. *See* Fire-arms, &c., 10.  
Rocking chairs and horses. *See* Toys, 51.  
Rollers for calico printing. *See* Bleaching, &c., 14.  
Rollers for roads. *See* Roads, &c., 85.  
Rollers, land. *See* Agriculture, 81.  
Roots, cutting, slicing, pulping, washing, drying, and sorting. *See* Agriculture, 82.  
Ropes and bands for mines. *See* Mining, 71.  
Roughing horses. *See* Farriery, 53.  
Rudders. *See* Steering, 75.  
Ruffles and ruffs. *See* Wearing apparel, 66.  
Rulers and ruling machines. *See* Writing, 37; Artists' instruments, 54.

## S.

Sacks. *See* Weaving, 20.  
 Saddlery, &c., 34.  
 Safes, &c., 64.  
 Safety lamps. *See* Lamps, 44.  
 Safety pockets. *See* Wearing apparel, 68.  
 Safety valves of steam boilers. *See* Steam engine, 49.  
 Sails. *See* Masts, &c., 73.  
 Salt, common. *See* Acids, &c., 40.  
 Saltpetre. *See* Acids, &c., 40.  
 Salts. *See* Acids, &c., 40.  
 Salt water, obtaining freshwater from. *See* Purifying &c., water, 79.  
 Scales. *See* Raising, &c., 31.  
 Scarifiers. *See* Agriculture, 81.  
 Screening grain, &c. *See* Agriculture, 82.  
 Screens. *See* Furniture, 39.  
 Screw propellers for carriages and agricultural implements. *See* Aids to locomotion, 7.  
 Screw propellers for ships. *See* Marine propulsion, 5.  
 Screws. *See* Nails, &c., 58.  
 Scythes. *See* Agriculture, 81.  
 Sealing wax. *See* Writing, &c., 37.  
 Sea walls. *See* Harbours, &c., 77.  
 Seed sowing. *See* Agriculture, 81.  
 Seltzer water. *See* Unfermented beverages, &c., 86.  
 Semaphore signals. *See* Railway signals, 38.  
 Sewage farming. *See* Agriculture, 81.  
 Sewers. *See* Drains, &c., 1.  
 Sewers, ventilating. *See* Ventilation, 52.  
 Sewing, &c., 2.  
 Sextants. *See* Optical, &c., 76.  
 Shackles. *See* Chains, &c., 90.  
 Shades. *See* Lamps, 44.  
 Shakos. *See* Fire-arms, &c., 10;  
 Wearing apparel, 65.  
 Shaving brushes. *See* Brushing, 57.  
 Shawl pins. *See* Wearing apparel, 68.  
 Shawls. *See* Wearing apparel, 66.  
 Shawls, weaving. *See* Weaving, 20.  
 Shear legs. *See* Raising, &c., 31.  
 Shearing fabrics. *See* Dressing, &c., 91.  
 Shearing sheep. *See* Farriery, &c., 53.  
 Sheathing metals. *See* Metals, &c., 18.  
 Sheep washes, dips, &c. *See* Farriery, &c., 53.  
 Ship-building, &c., 21.  
 Ship lamps and lanterns. *See* Lamps, 44.  
 Ships, steering and manœuvring. *See* Steering, 75.  
 Ships, ventilating. *See* Ventilation, 52.  
 Shirts. *See* Wearing apparel, 66.  
 Shoes. *See* Wearing apparel, 67.  
 Sickles and reaping hooks. *See* Agriculture, 81.  
 Signal lamps. *See* Lamps, 44.  
 Signals. *See* Electricity, 15; 94; Railway signals, 38.  
 Silicic acid. *See* Acids, 40.

Silver. *See* Metals, &c., 18; Acids, &c., 40.  
 Singeing fabrics. *See* Dressing, &c., Singeing horses. *See* Saddlery, &c., 34; Farriery, 53.  
 Siphons. *See* Hydraulics, 32; Preparing, &c., cork, 56.  
 Sizing machines. *See* Weaving, 20.  
 Skates. *See* Toys, 51.  
 Skidding wheels. *See* Common road carriages, 92.  
 Skins, &c., 55.  
 Skirts. *See* Wearing apparel, 66.  
 Sleeve links. *See* Wearing apparel, 68.  
 Slide rules. *See* Optical, &c., 76.  
 Slippers. *See* Wearing apparel, 67.  
 Slips. *See* Harbours, &c., 77.  
 Sluices. *See* Harbours, &c., 77.  
 Smelting furnaces. *See* Iron and steel, 6; Metals, &c., 18.  
 Smutters. *See* Agriculture, 82.  
 Snuff and snuff boxes. *See* Tobacco, 42.  
 Soap. *See* Oils, &c., 27.  
 Socks. *See* Wearing apparel, 66.  
 Soda. *See* Acids, &c., 40.  
 Soda water. *See* Unfermented beverages, &c., 86.  
 Sodium. *See* Acids, &c., 40.  
 Solitaires. *See* Wearing apparel, 68.  
 Sounding apparatus. *See* Optical, &c., 76.  
 Spectacles. *See* Optical, &c., 76.  
 Spectroscopes. *See* Optical, &c., 76.  
 Spinning, 28.  
 Spirit levels. *See* Optical, &c., 76.  
 Spittoons. *See* Tobacco, &c., 42.  
 Spontaneous combustion, preventing. *See* Fire engines, &c., 88.  
 Spring balances. *See* Raising, &c., 31.  
 Springs for common road carriages. *See* Common road carriages, 92.  
 Springs for railway carriages. *See* Carriages, &c., for railways, 46.  
 Spurs. *See* Saddlery, &c., 34.  
 Stable brushes. *See* Brushing, 57.  
 Stable fittings. *See* Saddlery, &c., 34.  
 Stacks and stackers. *See* Agriculture, 82.  
 Stands for casks. *See* Casks, 74.  
 Stands for music. *See* Music, &c., 26.  
 Stannates. *See* Acids, &c., 40.  
 Stationery. *See* Paper making, 11; Cutting, folding, &c., 12; Writing, &c., 37.  
 Staves, cutting, shaping, &c. *See* Casks, 74.  
 Stay fastenings. *See* Wearing apparel, 68.  
 Stays. *See* Wearing apparel, 66.  
 Steam boilers. *See* Steam engine, 49.  
 Steam culture, 8.  
 Steam engine, 49.  
 Steam gauges. *See* Steam engine, 49.  
 Steam rams. *See* Ship-building, 21.  
 Steel. *See* Iron, &c., 6.  
 Steelyards. *See* Raising, &c., 31.  
 Steering ships and vessels, 75.  
 Stencil plates. *See* Printing, 13.  
 Stereoscopes. *See* Optical, &c., 76.  
 Stereotype. *See* Letterpress printing, 13.

Stirrups. *See* Saddlery, &c., 34.  
 Stocking fabrics. *See* Lace-making, 29.  
 Stocking frames. *See* Lace-making, &c., 29.  
 Stockings. *See* Wearing apparel, 66.  
 Stockings, elastic. *See* Medicine, &c., 25.  
 Stone breakers. *See* Roads, 35.  
 Stoneware. *See* Pottery, 24.  
 Stools, music. *See* Music, 26.  
 Stoppers. *See* Preparing, &c., cork, 56.  
 Stored goods, ventilating to prevent spontaneous combustion. *See* Fire engines, &c., 88.  
 Storing grain, &c. *See* Agriculture, 82.  
 Stoves. *See* Fuel, &c., 30.  
 Straw elevators. *See* Agriculture, 82.  
 Straw plait. *See* Lace-making, &c., 29.  
 Strong rooms. *See* Safes, &c., 64.  
 Strontia. *See* Acids, &c., 40.  
 Strontium. *See* Acids, &c., 40.  
 Studs. *See* Wearing Apparel, 68.  
 Submarine cables. *See* Electricity, &c., 15; 93.  
 Sugar, 48.  
 Sulphur and sulphuric acid. *See* Acids, &c., 40.  
 Sun dials. *See* Optical, &c., 76.  
 Surgery. *See* Medicine, &c., 25.  
 Surgery for animals. *See* Farriery, &c., 53.  
 Surgical instruments. *See* Medicine, &c., 25.  
 Surveying instruments. *See* Optical, &c., 76.  
 Suspension bridges. *See* Bridges, 36.  
 Sweeping. *See* Brushing, &c., 57.  
 Sweeping chimneys. *See* Fuel, &c., 30.  
 Sweeping roads. *See* Roads, &c., 35.  
 Swings. *See* Toys, 51.  
 Swivel links and swivel hooks. *See* Chains, &c., 90.  
 Swivels and swivel rings. *See* Wearing apparel, 63.  
 Swords. *See* Fire-arms, &c., 10.  
 Syringes. *See* Hydraulics, 32.  
 Syringes, surgical. *See* Medicine, &c., 25.

## T.

Tables. *See* Furniture, 39.  
 Tags for laces. *See* Wearing apparel, 68.  
 Tailors' irons. *See* Wearing apparel, 66.  
 Tannic acid. *See* Acids, 40.  
 Tanning leather. *See* Skins, 55.  
 Targets. *See* Fire-arms, &c., 10.  
 Tarpaulin. *See* Artificial leather, &c., 80.  
 Tartaric acid. *See* Acids, 40.  
 Tea, concentrated extracts of. *See* Tea, &c., 87.  
 Tea, manufacturing and preparing for sale. *See* Tea, &c., 87.  
 Tea, preparing as a drink. *See* Unfermented beverages, &c., 86.  
 Teasles. *See* Dressing, &c., 91.

Teeth, artificial. *See* Medicine, &c., 25.  
 Telegraphs, electric. *See* Electricity, 15; 93; 94.  
 Telescopes. *See* Optical, &c., 76.  
 Tent covers. *See* Artificial leather, &c., 80.  
 Testing chains. *See* Chains, &c., 90.  
 Theodolites. *See* Optical, &c., 76.  
 Thermometers. *See* Optical, &c., 76.  
 Thimble. *See* Sewing, 2.  
 Thrashing machines. *See* Agriculture, 82.  
 Throstles. *See* Spinning, 28.  
 Tiles. *See* Drains, &c., 1; Bricks, &c., 22.  
 Tilling land. *See* Agriculture, 81.  
 Tills. *See* Safes, &c., 64.  
 Tin. *See* Metals, &c., 18; Acids, &c., 40.  
 Tinning. *See* Plating or coating Metals, 23.  
 Tips, boot and shoe. *See* Wearing apparel, 67.  
 Tobacco, 42.  
 Toilet boxes. *See* Trunks, &c., 84.  
 Tooth brushes. *See* Brushing, 57.  
 Tops. *See* Toys, 51.  
 Torpedo boats. *See* Ship-building, 21.  
 Toys, &c., 51.  
 Tracing cloth and paper. *See* Artists' instruments, &c., 54.  
 Traction engines. *See* Steam engine, 49.  
 Traction ropes. *See* Agriculture, 81.  
 Trams. *See* Common road carriages, 92.  
 Travelling bags. *See* Trunks, &c., 84.  
 Trees, boot and shoe. *See* Wearing apparel, 67.  
 Tricycles. *See* Common road carriages, 92.  
 Troughs for washing. *See* Washing &c., 89.  
 Trouser strap fastenings. *See* Wearing apparel, 68.  
 Trousers. *See* Wearing apparel, 66.  
 Trucks. *See* Common road carriages, 92.  
 Trunks, &c., 84.  
 Tube brushes. *See* Brushing, 57.  
 Tubes, metallic. *See* Metallic pipes, 70.  
 Tubs, washing. *See* Washing machines, &c., 89.  
 Tungstic acid. *See* Acids, 40.  
 Tunnelling. *See* Mining, &c., 71.  
 Turbines. *See* Hydraulics, 32.  
 Turf cutters. *See* Agriculture, 81.  
 Turnip cutters. *See* Agriculture, 82.  
 Tuyeres. *See* Fuel, &c., 30.  
 Type. *See* Letterpress printing, 13.

## U.

Umbrellas, &c., 47.  
 Unfermented beverages, 86.  
 Unions for tubes. *See* Metallic pipes, 70.  
 Upholstery. *See* Furniture, 39.  
 Urinals. *See* Waterclosets, &c., 63.  
 Urns for tea, &c. *See* Unfermented beverages, &c., 86.

## V.

Vacuum pans for sugar. *See* Sugar, 48.  
 Valises. *See* Trunks, &c., 84.  
 Valves, air. *See* Ventilation, 52.  
 Valves, gas. *See* Gas, 17.  
 Valves, steam. *See* Steam engine, 46.  
 Valves, water. *See* Hydraulics 32.  
 Valves, watercloset. *See* Water-closets, 63.  
 Varnish, boot and shoe. *See* Wearing apparel, 67.  
 Varnishes. *See* Paints, &c., 50.  
 Vehicles for common roads. *See* Common road carriages, 92.  
 Vehicles, ventilating. *See* Ventilation, 52.  
 Velocipedes, &c. *See* Common road carriages, 92.  
 Vent pegs and spiles. *See* Preparing and cutting cork, &c., 56.  
 Ventilating mines. *See* Ventilation, 52; Mining, 71.  
 Ventilating railway carriages. *See* Carriages, &c., for railways, 46; Ventilation, 52.  
 Ventilation, 52.  
 Vermin on animals, destroying. *See* Farriery, 53.  
 Veterinary art. *See* Farriery, 53.  
 Viaducts. *See* Bridges, &c., 36.  
 Vinegar. *See* Acids, &c., 40.  
 Violins. *See* Music, &c., 26.  
 Vitriol. *See* Acids, &c., 40.

## W.

Wadding. *See* Dressing and finishing, &c., 91.  
 Waters. *See* Writing, &c., 37.  
 Waggon covers. *See* Artificial leather, &c., 80.  
 Waggons. *See* Common road carriages, 92.  
 Waggons, railway. *See* Carriages, &c., for railways, 46.  
 Waistcoats. *See* Wearing apparel, 66.  
 Walking-sticks. *See* Umbrellas, &c., 47.  
 Wallets. *See* Trunks, &c., 84.  
 Wardrobes. *See* Furniture, 39.  
 Warping land. *See* Agriculture, 81.  
 Warping machines. *See* Weaving, 20.  
 Warp machines or frames. *See* Lace-making, &c., 29.  
 Washing and sifting ores. *See* Metals, &c., 18.  
 Washing clothes, &c. *See* Washing machines, &c., 89.  
 Watches, &c., 9.  
 Watch protectors. *See* Wearing apparel, 63.  
 Water aerating. *See* Purifying, &c., water, 79.

Water, chemical treatment of. *See* Purifying, &c., water, 79.  
 Waterclosets, &c., 63.  
 Watercourses. *See* Harbours, &c., 77.  
 Watering land. *See* Agriculture, 81.  
 Watering roads. *See* Roads, 35.  
 Water meters. *See* Hydraulics, 32.  
 Waterproof fabrics, 80.  
 Waterproofing leather. *See* Skins, &c., 55.  
 Water, purifying and filtering, 79.  
 Wearing apparel,—body coverings, 66.  
 Wearing apparel,—dress fastenings and jewellery, 68.  
 Wearing apparel,—foot coverings, 67.  
 Wearing apparel,—head coverings, 65.  
 Weaving, 20.  
 Weighing. *See* Raising, &c., 31.  
 Well-sinking. *See* Mining, &c., 71.  
 Wet docks. *See* Harbours, &c., 77.  
 Wharves. *See* Harbours, &c., 77.  
 Wheat, thrashing, cleansing, drying, storing, &c. *See* Agriculture, 82.  
 Wheelbarrows. *See* Common road carriages, 92.  
 Wheels, railway. *See* Carriages, &c., for railways, 46.  
 Whips and whip sockets. *See* Saddlery, &c., 34.  
 Whistles. *See* Railway signals, 38.  
 Wicks. *See* Lamps, &c., 44.  
 Winding drums. *See* Raising, &c. 31; Mining, 71; Agriculture, 81.  
 Winding fabrics. *See* Dressing, &c., 91.  
 Windlasses. *See* Raising, &c., 31.  
 Windlasses, steam. *See* Raising, &c., 31; Steam engine, 49.  
 Windmills. *See* Air, &c., engines, 62.  
 Windmills used to propel ships. *See* Marine Propulsion, 5; Masts, &c., 73.  
 Window fastenings. *See* Locks, &c., 60.  
 Wine coolers. *See* Ice-making, &c., 85.  
 Winnowing machines for grain, &c. *See* Agriculture, 82.  
 Wire brushes. *See* Brushing, 57.  
 Wood paving. *See* Roads, 35.  
 Work bags and work boxes. *See* Trunks, &c., 84.  
 Wringing. *See* Washing, &c., 89.  
 Wristbands. *See* Wearing apparel, 66.  
 Writing instruments, &c., 37.

## Z.

Zinc. *See* Metals, &c., 18.  
 Zinc for paint. *See* Paints, 50.  
 Zinc oxides, &c. *See* Acids, &c., 40.

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